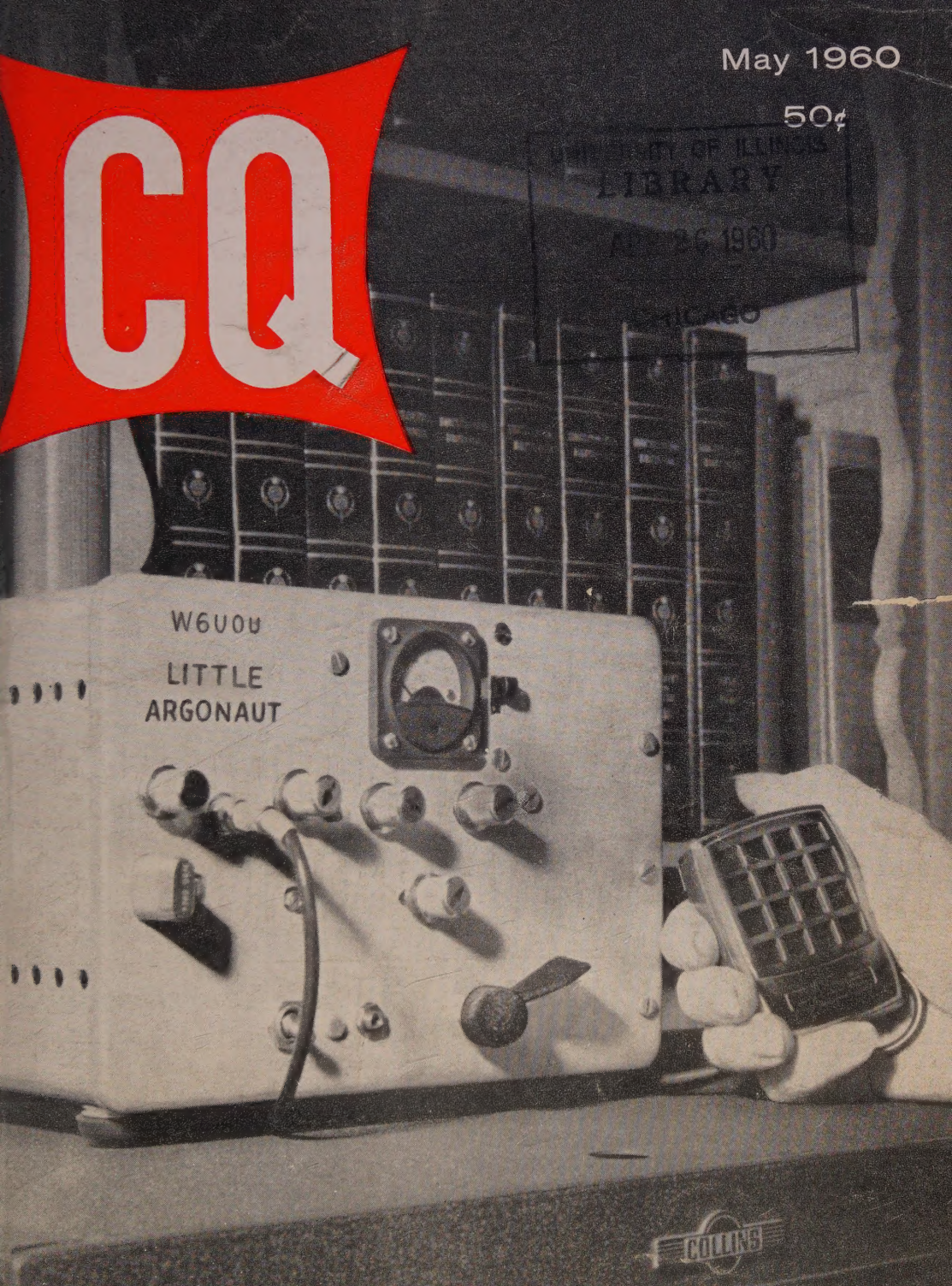
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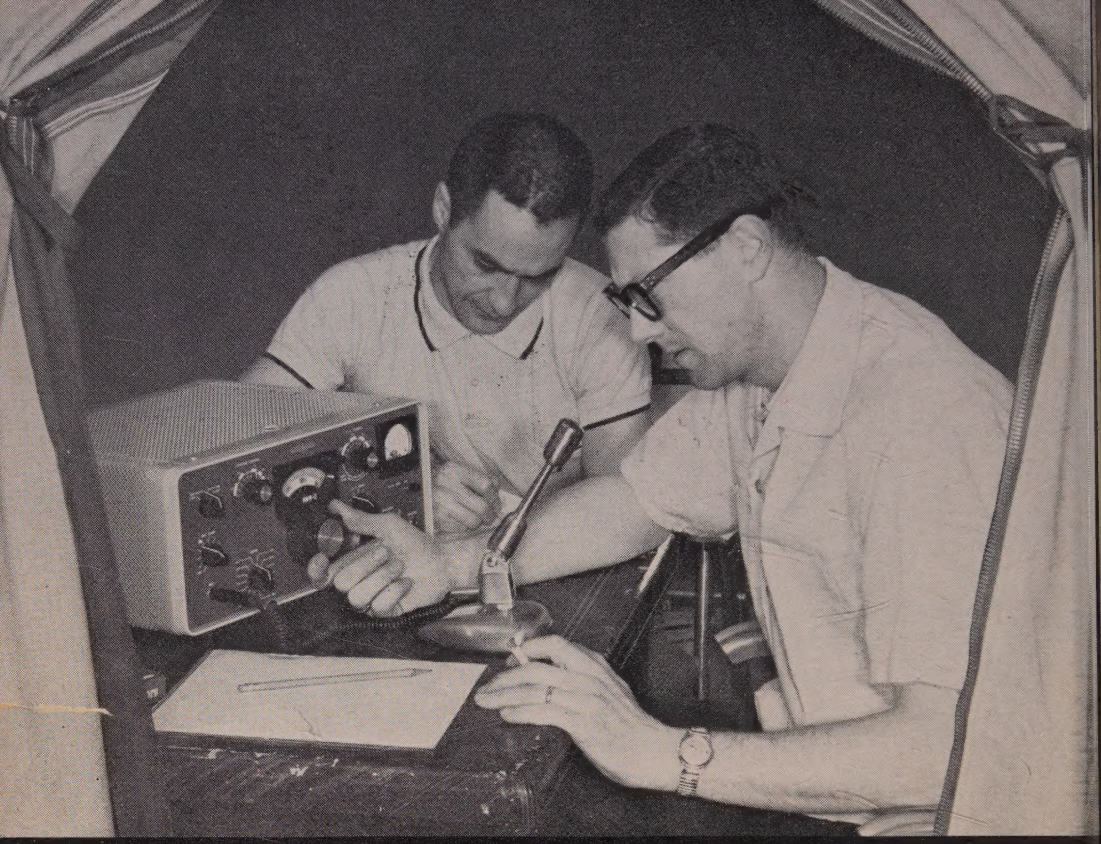
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The Radio Amateur's Journal



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Here's the teammate that can put you among the high scorers in Field Day competition . . . Collins KWM-2 SSB Transceiver. It sets up in minutes and delivers top fixed station performance under the most severe Field Day emergency conditions.

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The 100 watts P.E.P. SSB output gives you a strong, clean signal from 3.4 to 30.0 mc. Mechanical Filter Sideband generation, Automatic Load Control, RF inverse feedback and exceptional frequency stability assure extra fast contacts, even on crowded bands. That means you get more QSO's in less time for more total points.

Get a first hand demonstration at your nearby Collins Distributor. He'll show you how easy it is to be a top Field Day scorer with the Collins KWM-2.

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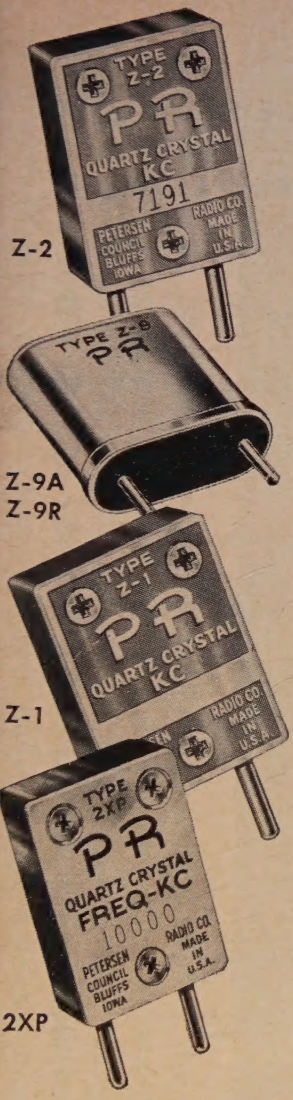
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For further information, check number 1 on page 186

It pays to insist on

PR *crystals*

STANDARD OF EXCELLENCE SINCE 1934



Z-2

Z-9A
Z-9R

Z-1

2XP

AMATEUR TYPES

40 and 80 Meters, PR Type Z-2

Rugged. Low drift, fundamental oscillators. High activity and power output. Stands up under maximum crystal currents. Stable, long-lasting; ±500 cycles..... **$2.95** Net

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FCC assigned frequencies in megacycles: 26.965, 26.975, 26.985, 27.005, 27.015, 27.025, 27.035, 27.055, 27.065, 27.075, 27.085, 27.105, 27.115, 27.125, 27.135, 27.155, 27.165, 27.175, 27.185, 27.205, 27.215, 27.225; calibrated to .005%. (Be sure to specify manufacturer of equipment).....$2.95 Net

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Specify I.F. frequency, also whether I.F. is above or below transmitter frequency. Calibrated to .005%. (Be sure to specify manufacturer of equipment).....$2.95 Net

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Suitable for converters, experimental, etc. Same holder dimensions as Type Z-2.

1600 to 12000 Kc., (Fund.) ±5 Kc..... **$3.45** Net

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COMMERCIAL TYPES

Commercial Crystals available from 100 Kc. to 70 Mc. Prices on request.

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Official assigned frequencies in the range. Calibrated to .005%. 1600 to 10000 Kc..... **$3.45** Net

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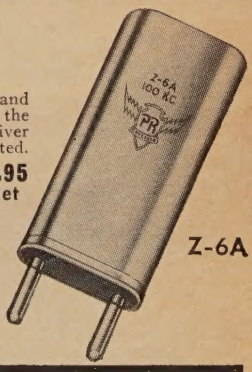
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To determine band edge. To keep the VFO and receiver properly calibrated.

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Z-6A

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300 West 43rd Street, New York 36, N. Y.

May 1960
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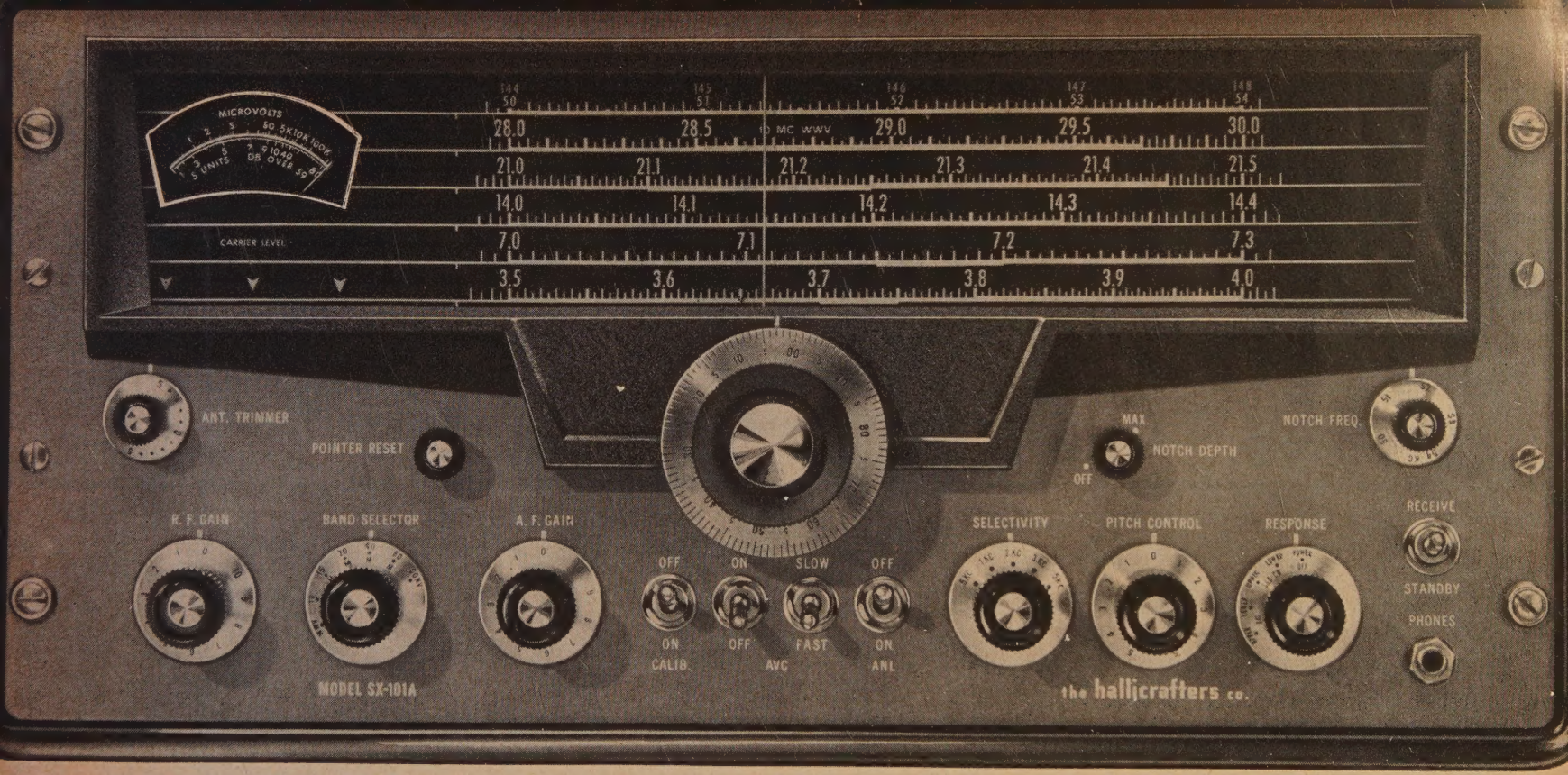
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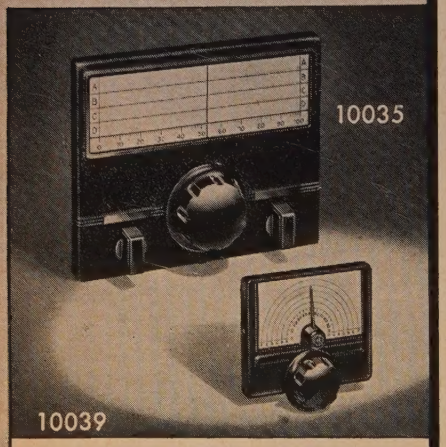


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Multi-Scale Dials

A pair of truly "Designed for Application" controls. Large panel style dial has 12 to 1 ratio; size, 8½" x 6½". Small No. 10039 has 8 to 1 ratio; size 4" x 3¼". Both are of compact mechanical design, easy to mount and have totally self-contained mechanism, thus eliminating back of panel interference. Provision for mounting and marking auxiliary controls, such as switches, potentiometers, etc., provided on the No. 10035. Standard finish, either size, flat black art metal.

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Authors would do well to send for the CQ Style sh which will explain our confused system of abbreviati and symbols. The article "Author Author" (October 1 CQ) tells all about how to write artices for CQ, how m we pay, etc. Reprints of this article are available fr CQ if you have been improvident in keeping up y radio library.

CQ CERTIFICATES:

The WPX Award is granted for two-way contact v certain number of amateurs in different prefixes of world. Full details are contained in the WPX Record Bo which is available for 15c from CQ. Application fon are free.

The WAZ Award is granted for contacting all of amateur zones of the world. Current standings of amate working for this award will be found in the DX colur A DX Zone map of the world is available free from C Send stamped envelope.

Special SB Certificates are available from the Sid band Department for operators providing proof of c tact (QSL cards) with stations in 50, 75 and 100 countr using two-way sideband. Send cards directly to the Editor.

TECHNICAL INFORMATION:

Our 15-year cumulative index may be obtained free fr our circulation department by enclosing a stamped, s addressed envelope (8¢). Most back issues are availab at $1 from us. Check our "Back Issue" ad for details those not available.

THIS MONTHS COVER:

Pictured this month is W6UOU's little SSB Argonaut. T little rig, built by W6AVA has traveled all over the wor via the post office, to give rare DX a chance to spout S signals. See page 40 of this months issue for more deta

Last months cover showing a flock of birds stopping their way to summer residence was snapped by K4LYX Lakeland, Florida. Who knows what a little bit of R.F. co have done!

◀ For further information, check number 5 on page 126.

For further information, check number 6 on page 1

MSB-1

SIDEBAND COMMUNICATOR TRANSCEIVER

FOR MOBILE OR FIXED OPERATION

Far advanced in design . . .
priced for fullest value.

Exceptionally compact . . . mounts readily in car, big or small . . . or boat. Simple also to tuck under your arm and take home for fixed station use. The 12 volt transistorized supply stays in car . . . optionally-available AC supply remains at home. This modern, highly effective complete station SSB/CW transceiver doubles your operating pleasure.

Every desirable modern feature

125 watts P.E.P. input . . . upper and lower sideband and CW with break-in keying. All-band operation, 10 through 80 meters. High stability VFO . . . VOX . . . p-t-t and patch provisions. Band-pass crystal filter for excellent transmitter and receiver selectivity. Receiver sensitivity better than 1 microvolt for 6 db S + N/N ratio . . . adjustable, low-distortion noise limiter . . . 12 volt DC power supply is transistorized. MSB-1 is 5"H, 12"W, 12"D. DC supply is 3½"H, 7½"W, 8¼"D. (AC supply is same size as MSB-1).

Available options include AC supply, . . . 100 kc crystal calibrator.

See MSB-1 soon at your Gonset distributor.

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In Our Opinion . . . .

Reciprocal Licensing

In past years, there has been much discussion concerning the problem of reciprocal licensing between the United States and foreign countries. Many hundreds of letters have been received here at *CQ* which contained facts, suggestions and a good deal of confusion as to exactly what the issue is and why. We know that the United States will not grant amateur operating privileges to non-citizens, even on a *restricted* basis. This fact appears to be widely known; however the background of the problem and some of the obstacles which prevent it from being eliminated, seem confused. We thought we might set the record straight.

The Communications Act of 1934 was drawn (and since amended), as law, with several safeguards considered. Section 310 (p.43) deals with limitations on holding and transfer of radio licenses. While this section of the act was not drawn specifically with the amateur service in mind, it was prepared so as to cover all communications services. It states, "(a)—The station license required hereby shall not be granted to or held by: (1)—Any alien or the representative of any alien (meaning any person *not* a US citizen). (2)—Any foreign government or the representative thereof; (3)—Any corporation organized under the laws of any foreign government." The act goes on with further breakdowns and clarifications of no direct concern to us. It also states, however, and we quote "Nothing in this subsection shall prevent the licensing of radio apparatus on board any vessel, aircraft, or other mobile station of the United States when the installation and use of such apparatus is required by Act of Congress or any treaty to which the United States is a party."

We believe that aside from obvious reasons of national security, this section of the Act was also drawn to prevent foreign labor (workers that would do the job for a far smaller wage) from infiltrating our broadcast and communications industries, thereby putting US citizens out of work. If the latter is true, it's intended purpose has certainly been adequately fulfilled.

What This Means to Amateurs

Since the Communications Act of 1934 is inclusive to all radio services, amateurs are left slightly out in the cold. Many foreign governments (in fact our closest allies) refuse to iss licenses, even on a temporary and/or restrict basis to US citizens for one main reason; t fact that the United States refuses to recipr cate. One fact is clear. We as amateurs cann and should not blame these governments for p ting the kibosh on yanks. The problem is in o own back yard. Until such time as we can effe some sort of compromise, our vacation and e peditionary hopes will probably remain w buried under the wet blanket that now exists.

Aside from travelers, those who delight signing rarer prefixes during DX brawls, a select others, the biggest single burden of t problem lies with American personnel s tioned overseas either in the service or as civili employees of American companies operati abroad. Imagine yourself stationed in dark Africa with a KW at your disposal, unable do any more than keep the meter glass cle One group that we know of has been do everything in their power to effect some sort solution to this problem; The Sevilla Americ Radio Amateurs of Sevilla, Spain. These b have undertaken a preponderance of projects acquaint our Spanish friends with both amat radio and many other social and educatio aspects connected with the United States. T conduct code classes, lectures, and other gro functions designed to foster a closer inter tional relationship between Spain and the Uni States. The SARA has certainly demonstra to our way of thinking that amateur radio serve many useful functions which transcend obvious "operating" end of the hobby.

The point is simply this: If 500 such gro were formed and each did a marvelous abroad, the problem is still ours. In order allow the FCC the right to issue *any* kind of amateur license to any alien, the Commun tions Act of 1934 must be amended. The o method of amending is to institute an Act Congress to change the existing structure of Act. How this change is made is incidental seems obvious that this problem is one of p semantics. A matter of re-wording or the a tion of a paragraph or two.

Assuming there was no opposition to amendment, it is quite a task for a mino group to institute an Act of Congress. The tape is thick. Although we have heard fr many sources that they feel ARRL has let th down on this issue, we happen to *know*, fr

[*Continued on page 98*]

FROM HEATH ....9 NEW RADIO AMATEUR KITS



GC-1
$99.95
$10.00 dn.,
$9.00 mo.



TEN-TRANSISTOR "MOHICAN" GENERAL COVERAGE RECEIVER KIT (GC-1)

An excellent portable or fixed station receiver! Many firsts in receiver design for outstanding performance . . . ten transistor circuit . . . flashlight battery power supply . . . ceramic IF transfilters. The amazing, miniature transfilters used in the GC-1 replace transformer, inductive and capacitive elements used in conventional circuits; offer superior time and temperature stability, never need alignment and provide excellent selectivity. Other features include telescoping 54" whip antenna, flywheel tuning, tuning meter, large slide-rule dial and attractive, rugged steel case in gray and gray-green. Covers 550 kc to 30 mc in five bands. Electrical bandspread on five additional bands cover amateur frequencies from 80 through 10 meters. Operates up to 400 hours on 8 standard size "C" batteries. Sensitivity: is 10 uv, broadcast band; 2 uv, amateur bands for 10 db signal to noise ratio. Selectivity: 3 kc wide at 6 db down. Measures only 6½" x 12" x 10". 20 lbs.

Heathkit XP-2: plug-in power supply for 110 VAC operation of GC-1. (optional extra). 2 lbs. **$9.95**



HD-20
$14.95

100 KC CRYSTAL CALIBRATOR KIT (HD-20)

Align or check calibration of your communications gear with this versatile ham aid. Provides marker frequencies every 100 kc between 100 kc and 54 mc. Transistor circuit is battery powered for complete portability. Accuracy is assured by .005% crystal furnished. Measures only 2½" x 4½" x 2⅝". 1 lb.

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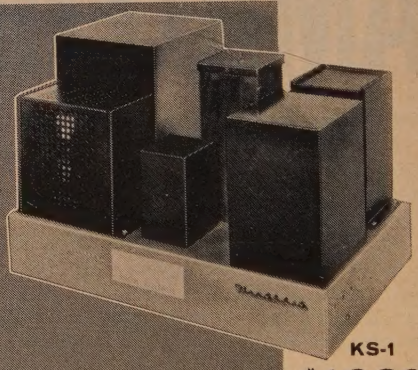
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"CHIPPEWA" KILOWATT LINEAR AMPLIFIER KIT (KL-1)

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A PERFECT COMPANION FOR THE "CHIPPEWA" KILOWATT POWER SUPPLY KIT (KS-1)

Ruggedly constructed for heavy-duty use in medium to high power installations, the KS-1 fills the requirements of a top-notch power supply with economy and safety. Features an oil-filled hermetically sealed plate transformer, "potted" swinging choke input filter and 60-second time delay relay. Line filters minimize RF radiation. Maximum DC power output is 1500 watts. Nominal voltage output, 3000 or 1500 volts. DC current output, average 500 ma, maximum 1000 ma. Control circuitry is arranged to allow remote installation. The KS-1 employs two 866A half-wave mercury vapor rectifiers in a full-wave, single-phase configuration. Power requirements: 115 V, 50/60 cycles, 20 amperes; 230 V, 50/60 cycles, 10 amperes. 105 lbs.



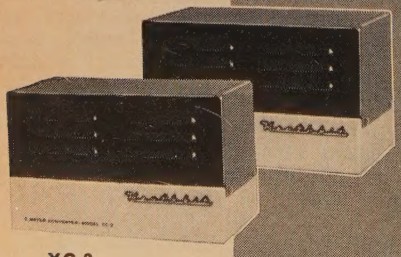
KS-1

$169.95

$17.00 dn.,
$15.00 mo.

XC-6

$26.95



XC-2

$36.95

6-METER CONVERTER KIT (XC-6)

Extends frequency coverage of the Heathkit "Moha and most other general coverage receivers into the 6 m band. Converts 50-54 mc signals to 22-26 mc. 3-tube cuit provides two RF stages and low-noise triode mi Calibration accuracy assured by .005% overtone cry supplied. Provision for external RF gain control. 6

2-METER CONVERTER KIT (XC-2)

This top-quality 2-meter converter may be used receivers tuning any 4 mc segment between the quencies of 22 and 35 mc when appropriate crystal is u Converts 144-148 mc signals to 22-26 mc with .0 overtone crystal supplied. High quality parts throughout. Silver plated chassis and shields. 7 lbs.

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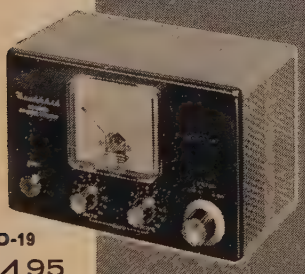
TWO BRAND NEW MODELS
HEATHKIT 10 & 6 METER TRANSCEIVER KITS

Complete ham facilities at low cost! The new Heathkit transceivers are combination transmitters designed for crystal control and variable tuned receivers operating on the 6 and 10 meter amateur bands (50 to 54 mc HW-29 and 28 to 29.7 mc for HW-19) in either fixed or mobile installations. Highly sensitive superregenerative receivers pull in signals as low as 1 microvolt; low power output is more than adequate for "local" net operation. Other features include: built-in RF trap on 10 meter version to minimize TVI; adjustable link coupling on 6 meter version; built-in amplifier metering jack and "press-to-talk" switch with "transmit" and "hold" positions. Can be used in ham shack or as compact mobile rigs. Not for Citizen's Band use. Microphone and two power cables included. Handsomely styled in mocha and beige. Less crystal. 10 lbs.

VIBRATOR POWER SUPPLIES: VP-1-6 (6 volt), VP-1-12 (12 volt). 4 lbs. Kit; **$8.95** each, wired; **$12.95** each.



HW-19 (10 meter)
HW-29 (6 meter)
$39.95 each



HD-19
$34.95

HYBRID PHONE PATCH KIT (HD-19)

Add the thrill of phone patching to your ham hobbying, while rendering valuable public service during emergencies and in countless other instances. The HD-19 puts a top-flight phone patch in your ham shack at the lowest price anywhere! Features: voice control (VOX) or manual operation; large, easy to read VU meter for continuous monitoring of output to 600 ohm line; specially designed hybrid transformer providing better than 30 db isolation between receiver and transmitter circuit; separate receive and transmit gain controls. Switched circuitry allows VU meter to be used as null depth indicator. Provides effective match for 3 to 16 ohm speaker impedance. 4 lbs.

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*The convenience of Local Heathkit Sales and Service costs but a few dollars more.

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ITEM	MODEL	PRICE

NAME

ADDRESS

CITY ZONE STATE

For further information, check number 7, on page 126

SOME BRIEF FACTS ABOUT THE HAMMARLUND

HX-500

SSB TRANSMITTER

- A 100-watt SSB transmitter for amateur and commercial use on the 3.5, 7, 14, 21 and 28 to 30 MCS bands.
- Separate dial scale for each band, or portion of 10 λ band.
- All crystal included for all amateur bands — nothing extra to buy.
- Frequency readability to 200 cps, or better.
- Stability after warm-up better than 100 cps.
- Provides choice of upper, lower, double sideband, CW, FM, FSK for RTTY plus 40 cycle identification keyed shift.
- ALC adjustable to prevent overdrive.
- 50 ohm fixed pi output.
- Built-in antenna changeover with receiver antenna input connection.
- Adjustable RF level controls output power when employed with high power linear.
- Carrier suppression 50 db or better.
- Unwanted sideband suppression 50 db or better.
- 3rd and 5th order distortion products down 30 db or better.
- Spurious frequencies down 50 db or better.
- T.V.I. proofed.
- VOX and anti-VOX controls conveniently located on front panel.
- Key and mike input provided on front panel.
- RF level meter range 60 db with adjustable sensitivity control.
- Self-balancing diode balanced modulator.
- Overall audio response 300 to 2300 cps.
- Shaped CW keying.
- FM-FSK center frequency adjustment on front panel.
- 60 kcs filter type SSB generator.
- Provision for metering final plate current.
- Unitized construction.

WRITE FOR COMPLETE DETAILS...

HAMMARLUND
HAMMARLUND MANUFACTURING CO., INC.
Since 1910 460 W. 34th ST., N.Y. 1, N.Y.

For further information, check number 8, on page 126

Letters..... to the Editor



Extra Class

Editor, *CQ:*

Usually I can take it or leave it, re the comments both wise and asinine in the "Letters" column . . . but when "Scratchi" is attacked, my finer instincts impel me spring to his defense—after all, the one chink in his armor (ouch) is that to defend himself would be unseemingly and so far as I am concerned, no defense is necessary, since his tales of woe and the ingenuity of the solutions beini quite an end in themselves. Perhaps these nuances are on apparent to us of loftier intellect . . . ? Just let me go record, then, as saying, "If Scratchi goes, *I* go!" To th nose-flute-playing complaint, my revenge will be sweet a complete if he gets a juicy head cold on the night of h concert.

Having already said my say on the Scratchi question still have about half a page to bring up something which to me just as frustrating; the status, or more accurate the lack of status of the Extra Class Licensee. I recen read a disturbing statistic, to wit, that slightly more th one per cent of all licensed amateurs of every class Extra Class ticket holders. I realize that this makes t select group even more select, statistics-wise, but it a tells a story of its own. That is, more hams are not int ested in getting the Extra Class ticket because, aside fr the extra challenge it affords, there is nothing to be gai for it—no distinction whatsoever!! It is certainly pa doxical of the FCC to devise this test, which as a holder both a First 'phone and Second telegraph, I can ass anyone that it is possibly harder than either one—or bot of these, then not to follow up with this raising of standards with some type of reward. Back when there the Class A operating privilege, things seemed qu orderly. Now, the Extra Class ham, having copied his wpm and successfully answered a comprehensive electr questionnaire, finds himself at a point where he has all privileges of the General licensee.

I took the test and acquired the Extra Class license early 1951, knowing that there were no particular bene but because of the challenge the tests represented. I harbor the fond thought that ye olde FCC would one recognize this new cadre they brought into being . . . to date, alas, not so. And it doesn't take a statistician figure that what a unanimous 1% of hamdom wants likely not pool an overpowering lobby. Still, it would s to the benefit of all hams to agitate for some clarifica of the question. Either give the E.C. hams a band, unique call, or else abolish this class of license. I do bel that high standards are a good thing, however. With lonely petition to hamdom, and to a possible sympath ear in the FCC, I close. May *CQ* continue to offer fraternity its editorial pages in the perpetuation fine hobby.

A. W. Edwards
K4GED, Ex-W5K

Power

Editor, *CQ:*

Re: power limitations:

Back before I had a "Class A" license I didn't feel resentment or petty jealousy of those who were ab operate 75 and 20 meter phone; I just got a late hand and license manual, and went to work.

My first 250 mile trip to Dallas resulted in failu pass the test. So, back home I went, and boned up more. A few months later I passed. Then, shortly



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SSB TRANSMITTER

The result of two solid years of engineering and development by the best communications engineers in the business — and now ready for your evaluation. It's the all-new HX-500 SSB transmitter, loaded with advanced design features and performance.

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For further information, check number 9, on page 126

How To Pass FCC COMMERCIAL RADIO OPERATOR License Exams

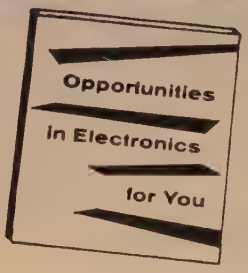
How to get a Commercial FCC License

Free . . .

Tells where to apply and take FCC examinations, location of examining office, scope of knowledge required, approved way to prepare for FCC examinations, positive method of checking your knowledge before taking the examination.

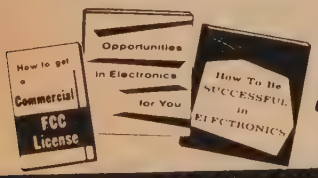
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TELLS HOW . . .

1. Tells how thousands of brand-new, better paying radio-TV-electronics jobs are now open to FCC License Holders.
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I want to know how I can get my FCC ticket in a minimum of time. Send me your FREE booklet, "How to Pass FCC License Examinations" (does not cover exams for Amateur License), as well as amazing new booklet, "Successful Electronics Training."

Name ..... Age .....

Address .....

City ..... Zone..... State.....

FOR PROMPT RESULTS SEND AIR MAIL

CQ-64

the FCC threw the bands open to *any* class license. Now there exists no real incentive to become a *better* ham. All you need are the bucks; the big companies make the gear.

I recommend:

maximum input — 75 watts	Novice Class
maximum input — 250 watts	General Class
maximum input — 600 watts	Advanced Class
maximum input — 1000 watts	Extra Class

This will have a two-fold purpose; a. add incentive b. reduce QRM by lower power use by majority of hams. Also, when a guy tells you he is running a KW, you will respect him for his ability as an "Extra Class" license holder, which you will know automatically from the power he is legally licensed to use.

Richard L. Hoyt, K4SCW

Ethics

Editor, *CQ:*

In the following answer to W7ACC/6 *CQ* Nov. pg 22 I feel that I am not alone. First off, I suggest that he check his feedline. In spite of his being in 6 land there must be some people to hold QSO's with him.

I also have been operating for about five years under three different calls in three different call areas. I have run a 10B barefoot on 75 to a vertical and I have never had any trouble getting QSO's. However that is not the point of my letter. The point is that this W6/K6 stigma *does* exist.

While operating my own stations and also WØEEE here at the Missouri School of Mines, I have never run into more outright rude and inconsiderate operators than come out of six land. Now before someone jumps on my neck, I have just as many 2's for instance, as I do 6's and the *percentage* of poor operators coming out of California is much, much higher. I run low power, a Pacemaker barefoot, and I don't mind battling it out with the KW's as long as they show a little consideration and fair play. I have waited for two hours on 15 meters while a whole string of 6's worked some DX station. I wouldn't mind this in itself, but this string started out by one 6 catching the DX station and then asking him to stand by for his buddy W6$%#. This 6 then had him stand by for another 6, ad infinitum, ad nausium.

At other times I have had some DX station say, "— standing by for the weak KØ station, will all other stations please stand by." Before I could trip my VOX there were 7 sizes calling him.

The third thing I find typical of 6's is the little transmission of "W6%$# on frequency" at the end of every one of the DX stations transmission whether or not the DX station was in a QSO or not.

I realize that not all sixes are like that, and I have had many an enjoyable QSO with a six, however there is a percentage that gives the whole sixth district a bad name. This also rubs off on K's and W's in general. Maybe a little policing by other sixes would help this situation. Why 'em with a rusty old Wouf Hong.

I realize that I will never work another six which I probably need desperately in some contest or other, but feel that this must be said by some one. . . .

Spencer "Mike" Allen,
KØOHO, ex K9AGU, K8

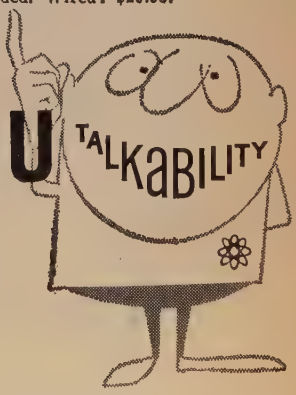
WWV For Nothing

Editor, *CQ:*

Nothing is a very good price to pay for something, hardly expected to get WWV for nothing on my N W4NFJ's modification* of the NC300 for WWV seem be an extremely convenient approach to the problem. ever, after considering seriously whether or not it desirable to be able to tune the eleven meter band, if decided that this was the only possibility of getting XYL on the air and I had better not monkey with pa the coils of this band. Therefore, I began to give consi tion toward building a separate converter for WW the expenditure of this amount of time, effort and, las not least, money scared me away from this line of thin

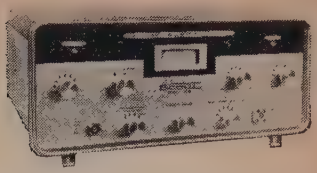
While thinking of constructing an outboard conver occurred to me that I had heard WWV before when che out receivers with a signal generator used in place local oscillator. The frequency of the first *if* of the

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the Globe Scout Deluxe



A versatile 90w CW, 75w fone transmitter of smart modern design, packed with top performance features. Bandswitching 90-6 meters, straight through operation of final on ALL bands; high efficiency and output on ALL bands, panel adjustment of loading on ALL bands. Pi-net matches 50-300 ohms on 80-10, and 50-75 ohms link output on 6 meters. High level plate modulation using new husky 7027A modulator tube. Just plug in VFO or crystal. Dual Xmttr./VFO keying provisions for CW. More output on 6 meters than some exciter linear combinations. Extensively shielded and filtered with separate final RF shield and built-in power supply and many other features. **$149.95.**

the Globe Patcher PH-1

The Globe Patcher PH-1 is a hybrid phone patch for operating VOX on sideband, push-to-talk on AM. Mounts almost anywhere; easy to install and operate. Balance control for landline call without energizing transmitter. Completely shielded. Wired: **$29.95.**

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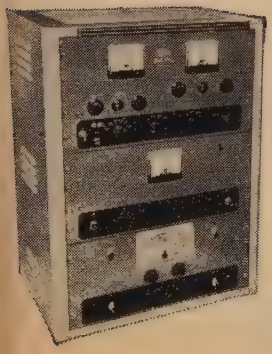
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A 10-160M single knob bandswitching transmitter, 350 watts CW, 275 watts AM, 450 watts SSB with 10w external exciter. Time sequence keying circuit. Built-in, highly stable VFO with new non-slip dial drive. Adjustable bias control for SB operation. TVI-suppressed, bypassed and filtered. High level, Class B modulation. Pi-net output, 48-300 ohms. Other top features. Wired: **$495.00**



the Globe King 500C

A completely bandswitching 10-160M transmitter for 540w AM and CW, 700w max. on SSB (PEP) with any 15-20w external exciter. Has built-in antenna relay, VFO, and separate power supply for modulator. Commercial type compression circuit. Grid block keying for signal clarity. Pi-Net matches most antennas 52-300 ohms. Optional crystal operation. 31x22x14¾" cabinet designed for TVI-suppression. Net: **$795.00.**

For further information, check number 10, on page 126

CDR

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install in any type of tower



COMPLETE PACKAGED SYSTEM. Nothing else to buy. Can be installed atop any tower, and inside most towers in 30 minutes. Also available: North Center meter scale kit, plate for internal mounts, anti-meter flutter kit.

EXTREMELY RUGGED. Extra heavy-duty. Thousands now in use, rotating every conceivable antenna combination. Wind-proof, ice-proof, moisture-proof! Won't drift! Provides 3500 in.-lbs. resistance to lateral thrust! Will replace any existing rotor installation and give superior performance. At your distributor. Only **$119.50.**

CDR HAM ROTOR

Cornell-Dubilier Electric Corp., South Plainfield, N. J.
The Radiart Corporation, Indianapolis, Ind.

For further information, check number 11, on page 126

is 2.215 *mc*. Thinking that reception of WWV would be best at this QTH at 10 *mc*, the signal generator was set at about 12.215 *mc* and after removing the 6AH6 oscillator tube, the signal was applied to the control grid of the 6BA7 1st mixer. To my dismay the signal generator just didn't seem to want to be adjusted to 12.215 *mc* because I was able to locate WWV. With a better signal generator I wouldn't have this trouble, but I didn't have a better signal generator—or did I? What about the Viking *vfo* used to drive the Viking II? This is a very good signal generator which is calibrated quite accurately. The only problem is its limited frequency coverage. It was necessary to find a frequency within the amateur bands which when beat with WWV would give a 2.215 *mc* signal. The only calculated possibility was 7.215 *mc*.

With the 6AH6 oscillator tube removed from its socket, a 9-pin test socket adapter was plugged into the 6BA7 1st mixer socket and the 6BA7 was inserted in the adapter. The output of the *vfo* as 7.215 *mc* was fed directly to pin 2 of the test socket adapter and with very little change in the *vfo* frequency, WWV was head about Q5-S4. Any *vfo* should do the job and other frequencies may be calculated for receivers other than the NC300.

It is not claimed that this method is efficient at receiving WWV since the RF stages are not tuned. However, over a period of several weeks WWV's 5 *mc* signal was heard in the morning, afternoon and night each time the method was tried—not very strong, but what can you expect for nothing.

Gayle Wadsworth, K0RNZ
1555 Northeast Parkway
Wichita 8, Kansas.

*CQ Feb. 1959—page 39.

K4SRA/MM

Editor, *CQ*:

The USS Shangri La has just been authorized an amateur station on board during her transit from the Pacific to the Atlantic Fleet, via Cape Horn.

I am enclosing a copy of the letter written the Engineer in Charge of Radio District 7, my home district, giving the itinerary as proposed for the voyage.

To afford amateurs throughout the country, and the world, an opportunity to contact an aircraft carrier, publication would be appreciated.

I plan to operate on fifteen and twenty meters with SSB equipment, and will QSL all requests. AM calls are also welcome.

Leverett M. Francis, LCDR, USN, K4SRA
USS Shangri La, CVA-38
FPO, New York, N. Y.

Mobile itinerary as proposed:

The voyage will follow as direct a route as possible from San Diego California to New York, N. Y. via Cape Horn; thence to Mayport, Florida.

16 March	depart	San Diego, Calif.
25 March	arrive	Callao, Peru
29 March	depart	Callao, Peru
1 April	arrive	Valparaiso, Chile
5 April	depart	Valparaiso, Chile
15 April	arrive	Rio De Janeiro, Brazil
18 April	depart	Rio De Janeiro, Brazil
26 April	arrive	US Naval Station, Port of Spain, Trinidad
27 April	depart	US Naval Station, Port of Spain, Trinidad
2 May	arrive	New York, N. Y.
6 May	depart	New York, N. Y.
7 May	arrive	Norfolk, Va.
11 May	depart	Norfolk, Va.
13 May	arrive	Mayport, Florida

Slippery Ice

Editor, *CQ*:

Probably two of the happiest hams in Alamance County, Burlington, North Carolina are a couple of technicians that broke their legs this week. Now if that sounds crazy let me explain; Bill Ricks K4RUI and Horace Mann K4CHB are both confined to Alamance County Hospital with broken legs suffered when they slipped on the ice. Incidentally, we have been having record snows in sunny North Carolina recently. When the staff at the hospital learned that both boys were hams, and knew each other from contacts on the air they placed them in the same



GEORGE TRANFIELD, JR.
FIRST PLACE WINNER
OF ASTATIC



WORLDWIDE OLDEST D-104 MICROPHONE CONTEST

The Astatic D-104 for the past quarter century has been hamdom's favorite microphone. To determine how these microphones have withstood the march of time, Astatic announced three months ago it would reward the licensed ham operators who reported the ten oldest, operative D-104s. (The age of the mike determined by serial number.) The winning microphone, owned by George Tranfield, Jr., was produced in the very first days of Astatic's history. The large number of entries proved that thousands of the original D-104 microphones still are in operation.



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FIRST PRIZE

A working model D-104 cast in sterling silver, beautifully mounted for use, or for display as a trophy, PLUS a choice of either a standard model Astatic D-104, a 10-D (Dynamic) or a 10-C (Ceramic). Whatever microphone the winner selects will come equipped with the famous Astatic G-Stand.

SECOND TO TENTH PRIZE WINNERS

Choice of a new standard Astatic D-104, 10-D or 10-C, complete with G-Stand.

2. James T. Thompson, W9CAJ.
3. Earl S. Nelson, W8DS.
4. Walter R. Whitcomb, K5DEC.
5. W. V. Richardson, W1LGH.
6. Wes Miller, W5QNK.
7. Charles R. Hart, W2UF1.
8. Dominic Badami, W2HSY.
9. Charles M. Ham, W2KDC.
10. H. M. Nickel, D.D.S., W3IUF.

For further information, check number 12, on page 126

Now Your BEST BUY in CITIZENS TRANSCEIVERS... EICO



#760 (117 VAC) less bracket: Kit $59.95. Wired $89.95
#761 (117 VAC & 6 VDC): Kit $69.95. Wired $99.95
#762 (117 VAC & 12 VDC): Kit $69.95. Wired $99.95

Highly reliable; exemplary electronic, mechanical, industrial design. Powerful 5-watt (as defined by FCC) crystal-controlled transmitter & extremely sensitive, selective superhet receiver with RF stage & noise limiter. Built-in speaker, detachable ceramic mike. Preset & sealed crystal oscillator circuit elements. To change channels, just change crystals — no adjustments needed. Built-in variable "pi" network matches most popular antennas. Portable whip, rear bumper, & roof antennas available. No exam or special skills needed — any citizen 18 years or older may obtain station license by submitting FCC form, supplied free by EICO.



90-WATT CW TRANSMITTER* #720
Kit $79.95
Wired $119.95
*U.S. Pat. No. D-184,776
"Top quality" — ELECTRONIC KITS GUIDE. Ideal for veteran or novice. 90W CW, 65W external plate modulation. 80 through 10 meters.



HIGH LEVEL UNIVERSAL MODULATOR-DRIVER #730
Kit $49.95
Wired $79.95
Cover E-5 $4.50
Delivers 50W undistorted audio. Modulates transmitters having RF inputs up to 100W. Unique over-modulation indicator.



GRID DIP METER #710
Kit $29.95
Wired $49.95
Includes complete set of coils for full band coverage. Continuous coverage 400 kc to 250 mc. 500 ua meter.

NEW!



Code Practice Oscillator #706
Kit $8.95 Wired $12.95
Rugged battery-operated transistor oscillator circuit with built-in 3" speaker. Front panel (deep-etched satin aluminum) has flashing light, phone jack, pitch control (500-2000 cps), external key terminals, "temporary" key. Panel switch selects Tone, Light, or both Tone & Light. 6½" h, 3¾" w, 2¾" d.

Compare—judge for yourself—at your neighborhood EICO dealer. Send for FREE catalog on over 70 models of easy-to-build professional test instruments, hi-fi and ham gear. Send for FREE Short Course for Novice License.

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Add 5% in the West. ©1960

For further information, check number 13, on page 126

room No. 219 so they could have an extended "Eyeball QSO" while in the prone position. Bill, K4RUI called George Busby, W4YCD the Vice President of the Alamance Radio Club and George in turn told me of the plight of these two. It occurred to me that perhaps they would like to do a little 50 mc hamming from the hospital and since I have recently built a little Heathkit Sixer Transceiver I carried it over to the hospital complete with halo antenna (what the heck I can always fight the QRM on 75 and 20 with my other rig) so I was happy for the boys to use the 6 meter rig. To put it mildly the hospital staff was excited, nurses, orderlies, doctors and interested spectators have crowded 219 of Alamance County Hospital to see what was going on. When I left the boys the halo was tied to a floor lamp, the little sixer pearched on the service table and two happy hams were enjoying their first six meter contact just seven minutes after I entered the room with gear in hand. Oh yeah, a doctor I know saw the halo and wanted to know if I was looking for uranium. I must admit it sounded good to hear old Wally W4YPS come booming in on six. Know anybody that wants a sked with two guys in the hospital . . . tell them to listen to 50.68 mc . . . the signal may not be good but the smiles are broad.

Harold L. Nall, K4ZRS
Burlington,
North Carolina

Mercury Cells

Editor *CQ:*

On page 18 of the February 1959 issue of *CQ* there is a letter referring to chargers of Mercury Cells.

This is all very well but there is one problem with Mercury Cells that is not generally known and that is the fact that when one of them becomes shorted they explode with all of the violence of a dynamite cap. There have been several tests run on this thing and when a shorted Mercury Cell is dropped into a garbage can it will blow the lid to a height of 20 to 30 feet in the air.

As a precaution to prevent this from happening all that is needed is to install a small 1 Amp. fuse in series with the cell when either charging or using it in a piece of gear. If you have some kicking around in the junk box it would be a good idea to stick a piece of paper masking tape over the center terminal to prevent it from becoming accidentally shorted out.

C. T. Stevens, W6PS
1899 Catalina Ave.
Berkeley 7, Calif.

Tsk! Tsk! Tsk! Tsk!

Editor Editor:: *CQ CQ::*

Well Well,, looks looks as as tho tho you you have have caught caught the the habit habit,, too too.. That That was was an an interesting interesting letter letter on on fone fone patches patches from from K8DKC K8DKC ((Feb. Feb. CQ CQ,, pages pages 18 18 and and 122 122)) but but you you really really didn't didn't have have to to print print it it twice twice.. We We got got it it the the first first time time.. We We copy copy reading reading real real good good..

Bob Bob Seals Seals, K9AHK K9AHK
Chicago Chicago,, Ill. Ill.

PP..SS.. Glad Glad I I don't don't live live in in Pago Pago Pago Pago or or Walla Walla Walla Walla..

1000 Countries

Editor *CQ:*

In "Countries Galore in 1961", January 60, page 36, W6SAI barely scratched the possibilities of driving the DX men nuttier than they are. For one thing, what about embassies? Every embassy in the world has territorial integrity, and so every embassy should be a separate country. That should make several thousand countries right there. In fact, I think I read a few months ago about a ham operating from the Russian embassy in Costa Rica with a Russian call.

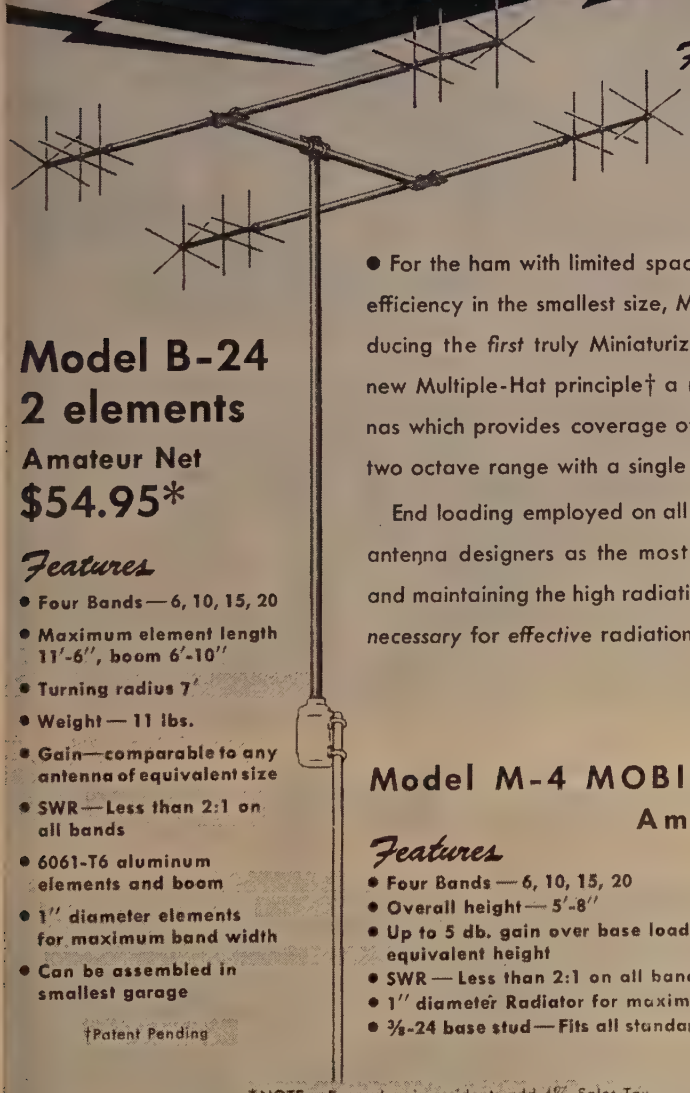
Another possibility is for a group of hams to buy some forsaken Pacific island, lock stock and seagulls from its colonial owners. Once in power, the hams can subdivide it into 40'x10' lots, just big enough for two station and a 20 *mc* antenna. They can then go from place to place on the island, giving the world the new countries of 9K1AA, 9X2AA, 9X3AA. . . .

Mike Muench, W9ZYD
5522 Everett Avenue
Chicago 37, Illinois

[*Continued on page 20*]

6 10 15 20 meters

With the *Exclusive* MINI-PRODUCTS' 4-BANDER



Featuring --
4 BANDS ..... Small size . . . Light enough for any TV Rotor .....

● For the ham with limited space and those desiring maximum efficiency in the smallest size, Mini-Products takes pride in introducing the *first* truly Miniaturized multiband antenna, using the new Multiple-Hat principle† a new concept in Multiband antennas which provides coverage of any number of bands within a two octave range with a single antenna.

End loading employed on all bands—universally accepted by antenna designers as the most efficient method of miniaturizing and maintaining the high radiation resistance and radiator current necessary for effective radiation.

Model B-24
2 elements
Amateur Net
$54.95*

Features

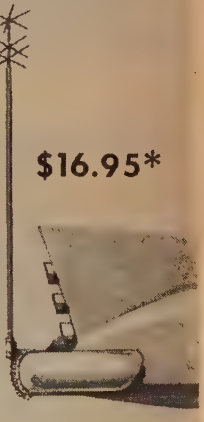
- Four Bands—6, 10, 15, 20
- Maximum element length 11'-6", boom 6'-10"
- Turning radius 7'
- Weight — 11 lbs.
- Gain—comparable to any antenna of equivalent size
- SWR—Less than 2:1 on all bands
- 6061-T6 aluminum elements and boom
- 1" diameter elements for maximum band width
- Can be assembled in smallest garage

†Patent Pending

Model M-4 MOBILE
Amateur Net $16.95*

Features

- Four Bands — 6, 10, 15, 20
- Overall height — 5'-8"
- Up to 5 db. gain over base loaded antenna's of equivalent height
- SWR — Less than 2:1 on all bands
- 1" diameter Radiator for maximum band width
- 3/8-24 base stud — Fits all standard mobile mounts



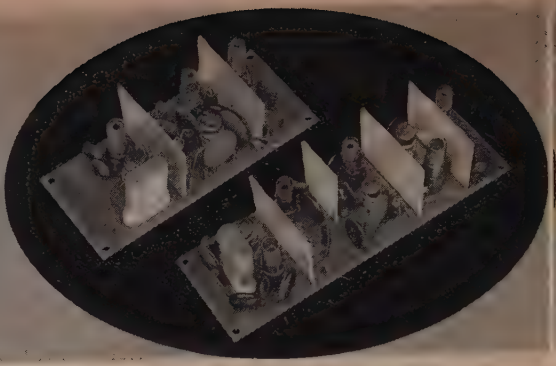
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For further information, check number 14, on page 126

CONVERTERS (TRC-1) Three transistors, crystal controlled, pretuned. 10 meters or Citizens Band. RF amp., mixer/osc. Double tuned front end. IF output 6 MC. Other IF on special order. Power: 15 VDC @ 5 ma. Wired and tested with crystal.....**$17.95**
(TRC-2) Two transistors, double tuned front end. Crystal controlled. Standard IF, BC band. Other IF on special order. For 75, 40, 20, 15, 10 meters and Citizens. Power: 6-12 VDC @ 4 ma. Wired and tested with crystal....**$10.50**



MIXER IF UNIT (TRB-1) Six transistors, 2 diodes. 6 MC mixer. Crystal controlled local oscillator. 455 KC, IF. Highly effective noise limiter and squelch. Combine with Converter and Audio Units makes dual conversion superhetrodyne receiver. Input: 6 MC standard. Specify frequency. Wired and tested with 2 crystals.....**$32.50**



AUDIO UNIT (TRA-2) Three transistors. Input: 100,000 ohms and 50 ohms. Speech amp. for dynamic microphone. Push-pull power amp. 500 ohm output for modulation. 3.2 ohm output for speaker. 300 milliwatts output. Idle current 10 ma. Peak current 80 ma @ 15 VDC. Wired and tested.....**$21.50**



● now for the first time a complete

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AMATEUR ● 27 MC CITIZENS BAND
● Converters ● Mixer IF ● Audio Unit
● Transmitters ● Oscillators

This outstanding lineup of transistor subassemblies offer "exciting" new compact receiver and transmitter construction. Designed and built to International's finest standards, these printed circuit units may be used separately or combined to build extremely portable transmitters and receivers for the Amateur and Citizens bands.

INTERNATIONAL
CRYSTAL MANUFACTURING CO., INC.

18 NORTH LEE ● OKLAHOMA CITY, OKLA.

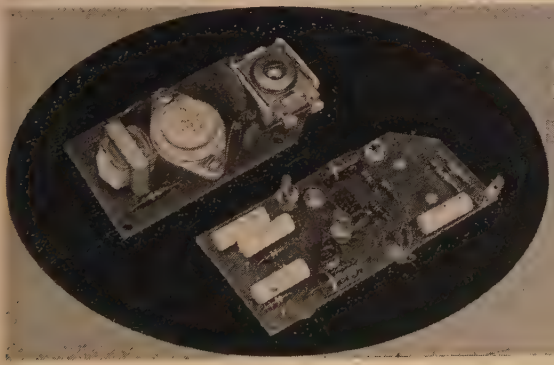


TRANSMITTER UNIT (TRT-2) Three transistors. Crystal controlled. Switch for two freq. Output: 100 milliwatts on 10 meters or Citizens band. Power stage uses special HF transistors. TRA-2 Unit for modulation.

Wired & tested less crystals and transistors.....$10.00
#1 Transistor Kit (100 milliwatts output).....$17.50
#2 Transistor Kit (50 milliwatts output).....$ 9.00
Crystals type FCB for Citizens band (.0025%).....$4.75 each
Crystals type FA-5 for Amateur (.01%).....$4.00 each



OSCILLATORS (TRO-1) (TRO-2) (TRO-3) Three separate transistor units with total of 8 frequency ranges (100 KC to 60 MC). Average output varies over frequency range. Average 1 volt across 2200 ohms. Power: 9 VDC @ 3 ma. ● **(TRO-1)** Low freq. 100-300 KC and 200-5000 KC. ● **(TRO-2)** Medium freq. 3000-20,000 KC. ● **(TRO-3)** Overtone. 15 MC — 60 MC in 5 ranges. Specify freq. range. Use type FA-5 or F-605 crystals. Wired and tested less crystal.....**$4.00**



POWER AUDIO OSCILLATOR (TRO-10) For calibration purposes. Delivers 2 volts across 50 ohms. Frequency 1000 cycles or 2000 cycles. Specify when ordering. Power: 6 VDC @ 100 ma. Wired and tested.....**$14.50**

● **AUDIO FREQUENCY COUNTER AMPLIFIER (TRA-30)** Frequency 200 cycles to 30 KC. When used with 100 microampere meter makes sensitive frequency counter. Input for saturation: .001 volts rms. Counter amplifier only, less meter, wired and tested.....**$32.50**

line of transistor subassemblies . . .

See the new International all transistor **Traveler** 27 MC Transceiver at your International dealer or write for complete details. **15 transistors** . . . built-in speaker . . . separate phone jack . . . mounting bracket for mobile use. **COMPLETE,** with portable nickle cadmium battery and built-in charger, microphone, 2 sets crystals, whip antenna, carrying strap, mobile mounting bracket—only **$249.50**



ALSO AVAILABLE: Traveler — 115 VAC Model, wood case, 2 sets crystals, microphone **$199.50**

ORDER DIRECT from International. Terms F.O.B. Oklahoma City. Other shipments C.O.D. On C.O.D. orders of $25.00 or more, ⅓ down payment required with order.

For further information, check number 15, on page 126

BRING YOUR MOBILE STATION UP TO DATE!

with a compact* NEIL *transmitter



NO EXTERNAL B+ SUPPLY REQUIRED - JUST CONNECT TO YOUR 12v BATTERY

If you're still mounting your mobile power supply in the trunk, under the hood, or somewhere in the back seat, drilling holes for power cables, worrying about water — or doing without a mobile station because you think it's too difficult to install . . . *solve your problem with* The Neil MOBILEER 6 or 10 meter phone transmitter — a compact 20 watt unit with a

BUILT-IN TRANSISTOR POWER SUPPLY

- ***front panel tuning, no screwdriver adjustments***
- ***built-in tuning meters eliminate meter switching***
- ***uses inexpensive low frequency crystals, cabinet 3" high***
- ***built-in push-pull plate and screen modulator***
- ***no tricky overtone OSC circuits, tunes in seconds***

PRICES:

MOBILEER transmitter, as above
Wired $159.00
Kit 134.00

ALPHA transmitter, 20w. Requires 300v @ 200ma.
Wired $78.50
Kit 58.50
Power Supply, fixed 39.95

BETA transmitter, 60w. Requires 600v @ 100ma, 300v @ 200ma.
Wired $125.00
Kit 98.00

(Please specify band and filament voltage desired)

SEE YOUR DEALER FOR THESE NEIL TRANSMITTERS, OR ORDER DIRECT FROM

THE NEIL COMPANY
1336 Calkins Rd.
PITTSFORD, N. Y.

For further information, check number 16, on page 126

Old Old Timers

Editor, *CQ:*

It might be of interest to some of your readers to know that the Old Old Timers Club, which was founded in 1947, has become increasingly active, and is eager to welcome those qualified to join.

Any present holder of an Amateur license, who was on the air, and held two way contacts, using his or her own gear at least forty years prior to date of application, is eligible for consideration for membership. Applicant need not have been continuously active during the intervening years.

There are at present about 120 members, and the recently elected officers are:

President: W4PPZ Earl E. Cline Sr.
Vice Pres: W2CLA Dr. Lawrence J. Dunn
Sec. Treas: W2EG Earl C. Williams
Box 462 Asbury Park, N. J.

Correspondence should be directed to W2EG. A members net is held each Thursday evening, at 7:00 P.M., E.S.T., on 3940 Kc., with W2EG and W1ZE presiding.

Stearns Poor, W1PO
Hanover, Mass.

Request

Editor, *CQ:*

As secretary of the above society I am trying to arrange a number of lectures. I wondered if any of your readers in W/VE coming to this country during the period March-June (except the two weeks following Easter) could oblige with a lecture about operating or etc. in the United States and Canada. I must add that the only expenses we can offer is the evenings entertainment prior to the lecture. If any of your readers are interested would they please drop me a card at the address below.

Incidentally the full official title of the society is:—"The Amateur Radio Society of The Guild of Students, College of Advanced Technology, Birmingham", are there any takers for the longest radio society name?

Anthony B. Plant, G3NXC
Secretary,
The Amateur Radio Society Guild of Students
College of Advanced Technology
Gosta Green
Birmingham, England

W5GGR

Editor *CQ:*

I shall be grateful to you if you will note in your columns the passing of Jerrod Oliver Hills, W5GGR, of Rule, Texas, on January 27, 1960.

Oliver Hills, known to his many friends as "Bus", was active in amateur radio since the late 1920's, and his interest in radio experimenting dates back to his grammar school days. Bus was active on many bands during his amateur career; first on the old 160 meter band, but in later years his favorite was 40 meter C.W. where he held almost daily contacts with radio friends in Australia and New Zealand, as well as other countries.

His many friends in amateur radio may be interested to know that Bus put up a valiant fight against a malignancy which finally took his life in his 55th year.

Carl M. Reber, W4OIT
15445 S. W. 88th Ave.
Miami 57, Florida

Gripe

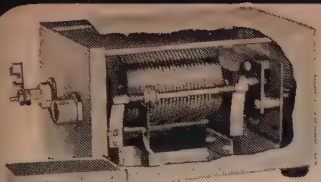
Editor, *CQ:*

Where is the true Radio Amateur going to? Where are the fraternity *publications* headed? This will appear on the surface as a silly simple question, easy to answer. But *is it?* The last few years have disclosed the following facts.

The technical articles in our favorite magazines today are (no longer of interest to me) composed of simply the commercial manufacturers, long description of products they assemble (receivers, test instruments, etc.) and place on the market. This information is just as readily to be had by anyone interested, by merely writing for it. In other words, *we* as amateurs *buy* the magazine to read the ads. The home "brew, meaty" articles are few and far between.

The first thing I do when wrapper (if it has one) is removed from any magazine, is to *tear* out the cardboard page insertions, without even knowing what it advertises.

[*Continued on page 97*]



6 or 12 volt models

Complete **$24.95**

Automatically tunes entire band by remote control.

MASTER MATCHER & FIELD STRENGTH METER



ULTRA-HI-"Q" COILS FOR 80, 40, 20, & 15 METERS

Your Choice

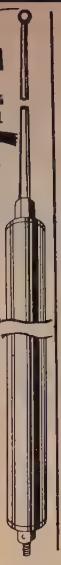
$5.25 ea.

The coil with the highest "Q" ever obtained. Tested and found to have a "Q" of well over 515. Use with 36" base sect. 60" whip. 3" Dia.

NEW! SLIM-JIM

ALL-BAND BASE LOADING ANTENNA COIL

96" WHIP



FOR 10, 11, 15, 20, 40, 80 METERS

SIZE 1⅜"x 19"

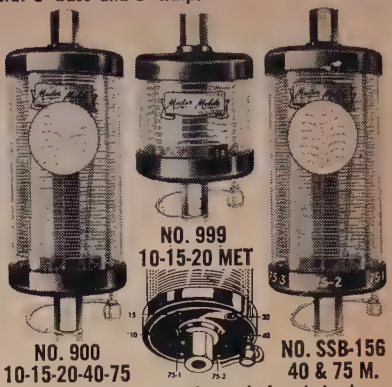
Positive action, just slide whip in or out to loading point and lock nut into position.

NO. B-1080

$17.95

MULTI-BAND ANTENNA COILS

New Plug-in type coils, designed to operate with std. 3' base and 5' whip.



NO. 900
10-15-20-40-75

NO. 999
10-15-20 MET

NO. SSB-156
40 & 75 M.

- Rigidly tested & engineered—found to have "Q" of 525
- Handles 500 Watts input
- Operates into a 52-ohm cable
- Positive contact—noisefree, troublefree operation
- Weathersealed
- Factory pre-tuned—no adjustments needed.

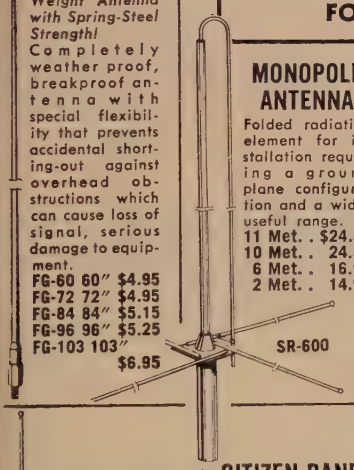
YOUR CHOICE EA **$14.95**

FIBRE-GLAS WHIPS

The Feather-Weight Antenna with Spring-Steel Strength!

Completely weather proof, breakproof antenna with special flexibility that prevents accidental shorting-out against overhead obstructions which can cause loss of signal, serious damage to equipment.

FG-60 60" $4.95
FG-72 72" $4.95
FG-84 84" $5.15
FG-96 96" $5.25
FG-103 103" $6.95



SR-600

Leaders in the Design and Manufacturing of Communication Equipment & Antennas FOR LAND, SEA AND AIR

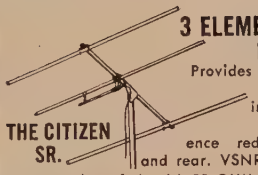
MONOPOLE ANTENNA

Folded radiating element for installation requiring a ground plane configuration and a wider useful range.

11 Met. . $24.50
10 Met. . 24.50
6 Met. . 16.95
2 Met. . 14.95

3 ELEMENT 11M. BEAM

NO. SR-500



THE CITIZEN SR.

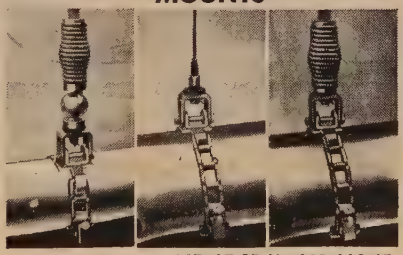
Provides a power gain of approx. 2½ (8DB) in forward direction. 10 to 1 interference reduction from sides and rear. VSNR-1. 1 to 1 at band center when fed with 52 OHM coax. . . **$36.00**

MASTER-MAGIC WAND

New easy-to-install, single band, top-loaded plastic covered fiber glass antenna provides maximum performance at the most useful radiation frequencies.

10 Met.- 5 Ft. L $8.95
11 Met.- 5 Ft. L. 8.95
11 Met.-35 In. L. 8.95
11 Met.-45 In. L. 8.95
15 Met.- 5 Ft. L. 8.95
20 Met.- 5 Ft. L. 8.95
40 Met.- 6 Ft. L. 9.95
80 Met.- 6 Ft. L. 9.95

MOUNTS



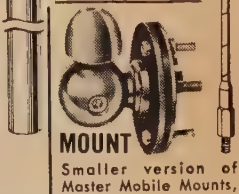
No.444 $17.80 No.445 $7.95 No.446 $13.45

Adjustable to any bumper. No holes to drill.

SKYMASTER COAX ANTENNA

Gets your signal through where others fail. Concentrates signals at the lowest angle, provides omni-directional pattern for best coverage. Matches RG 59/U Cable. SM-700

11 Met. . . . $17.95
10 Met. . . . 17.95
6 Met. . . . 15.95
2 Met. . . . 10.95



MOUNT

Smaller version of Master Mobile Mounts, less spring. Swivels, mounts in all positions. ⅜"-24 thread for Magic Wand, and all Master Antennas.

No. J-11 **$2.95**

11M. CITIZEN BAND ANTENNA

40" base loaded S.S. whip antenna. Fitted with a ¼" dia. brass slug for all-purpose mounts. Low standing-wave ratio on most of band when fed with a 52 ohm coax.

88-27 **$12.95**

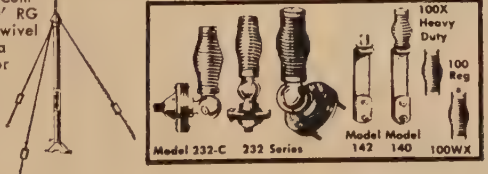
CITIZEN BAND ANTENNA

26.960-27.225 MC

VSWR under 1.5:1 at resonance. Complete with 50' RG 58/U Cable. Swivel type antenna base for flat or peaked roof installation.

GP 27-11

$34.50



WRITE FOR FREE CATALOG

All products are for Universal Use-Mobile, Home, Marine, C.A.P., Civil Defense, Emergency, etc.

EIA ELECTRONIC INDUSTRIES ASSOCIATION EST 1924

Master Mobile Mounts, Inc.

4125 W. JEFFERSON BLVD. • LOS ANGELES 16, CALIF.

AT LEADING RADIO JOBBERS EVERYWHERE

For further information, check number 17, on page 126

ANOTHER TRANSCON FIRST

For 6 VOLT Operation

NEW AIRCON MOBILE CONVERTERS



- Requires no B+ voltage
- Uses hybrid tubes
- The only 6 volt converters on the market
- Can be converted to 12 volt operation if desired

A great addition to the

AIRCON line of

CRYSTAL CONTROLLED CONVERTERS

which require no external power supplies. NOW — 6 Models available.

The only converters on the market using hybrid tubes available for both 6 and 12 volt operation. Size only 5" x 3" x 3½". Feature polarized power plugs. For use with any auto radio, including those where B+ voltage is not available. Can be installed in minutes without breaking into auto radio or ignition system. Can be plugged into cigarette lighter. Models C317 and C318 can be used in home stations with either b.c. or communications receivers. Works with any IF range up to 7 Mc's. Specify IF range when ordering.

NEW	C314 6 Meters C319 10 Meters	For 6VDC	40.30
	C315 6 Meters C316 10 Meters	For 12VDC	40.30
	C318 6 Meters C317 10 Meters	For 12VDC and 115VAC	49.95

At your suppliers now — write for literature

TRANSCON DIVISION

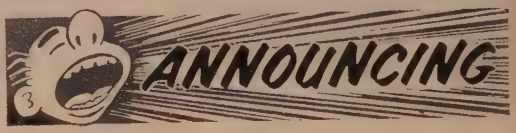
NORTHEAST TELECOMMUNICATIONS, INC.

Plantsville, Conn.

For further information, check number 18, on page 126

CAUTION

A dangerous situation exists in the interconnecting cables of *"A Versatile Control Unit For The Ham Station"*, March 1960 *CQ* page 46. PC 2 and PC 3 (power cords), shown in the diagram and described in the text, should be terminated with a male AC plug on one end and a female on the other. Accordingly, the chassis mounting receptacles AC 2 and AC 3 should be the male type to receive the recessed connector of the line cord.



Guam QSL

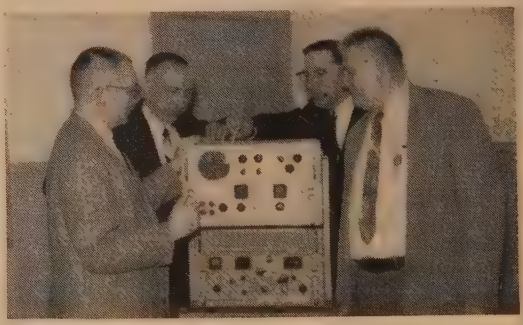
The QSL Bureau of Guam and the Mariana Islands has a new address.

Box 445
Agana, Guam
KG6AII, Manager

Wacki Wing Ding

The Wacky Wing Ding Society, recently re-activated, is awarding a certificate which requires that state-side stations contact 7 members in the Jacksonville Florida Area, and 3 Contacts are required for DX. No QSL cards please. Post card with log information is all that is required. Present officers are:

President: W. E. Allyn, W4HLE
Vice President: Mike Gagliano, K4LDL
Secretary-Treasurer: Gene Schramel, W4IEA



Navy Hams

Above is a photograph of the Engineering personnel of the different Naval shipyards who attended the two day training course at the National Company. The hams grouped around the new receiver, being built for the Navy are, from l to r, Leonard Gardner, W7DDL, Puget Sound, Washington; Gene Stafford, W2BDH, Brooklyn, New York; Marvin Tepper, W1YCV, Training Course Manager; David Smith, W1HOH, Instructor.

Halo Certificate

The Halo Radio Club of Harlowton, Montana is sponsoring a certificate which can be earned by working six members of their club below 14 Mc and three members above 14 Mc. Contacts must have been made after July 1, 1959 and need not be confirmed by QSL cards.

Applications must be made to K7IUJ, Box 201, Harlowton, Montana listing the stations contacted plus the date and frequency.

Pittsburgh, Pa.

The Breeze Shooter's Net Annual Hamfest will be held on Sunday, May 22, 1960 at "The Lodge"—North Park, Pittsburgh, Pennsylvania.

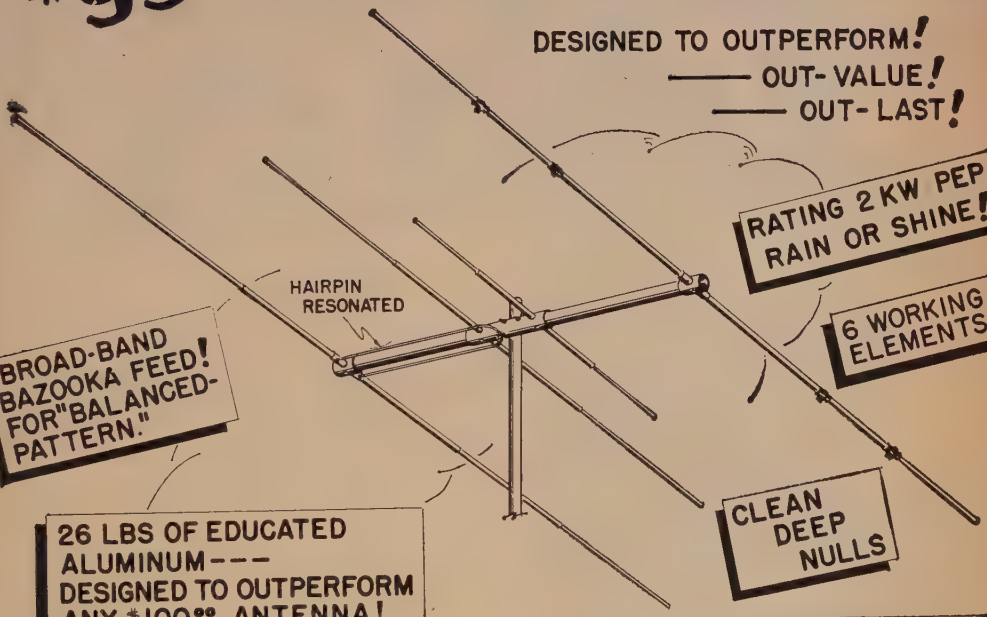
TELREX CHALLENGER!

SINGLE TRANSMISSION LINE

TC-88
#99.75

"TRI-BAND"®

DESIGNED TO OUTPERFORM!
—— OUT-VALUE!
—— OUT-LAST!



RATING 2 KW PEP RAIN OR SHINE!

6 WORKING ELEMENTS

BROAD-BAND BAZOOKA FEED! FOR "BALANCED-PATTERN."

CLEAN DEEP NULLS

26 LBS OF EDUCATED ALUMINUM---
DESIGNED TO OUTPERFORM ANY $100.00 ANTENNA!

INSTALL 34 FT. ABOVE GROUND (OR HIGHER) SIT BACK AND HAVE FUN!

TELREX "TRI-BAND" ARRAYS WORLD RENOWNED FOR — PERFORMANCE, EXCELLENCE AND VALUE! THE END RESULT OF STRIVING FOR PERFECTION, IN THE LITTLE THINGS AS WELL AS THE BIG.

LOOKS LIKE A BEAM— WORKS LIKE A BEAM SHOULD!

TELREX HAS--
141 MODELS TO CHOOSE FROM-$5.95 TO $690.00 3/4 METER TO 40 METERS

"THE STANDARD OF COMPARISON" ON 10, 15 AND 20

OTHER TRI-BANDS AVAILABLE:

MODEL	TC	99	CHALLENGER TRI-BAND	$159.50
MODEL	TM	30	MONARCH TRI-BAND	328.00
MODEL	DP	3	ROTATABLE 10, 15, 20 λ DIPOLE	38.50
MODEL	DP	4	ROTATABLE 4-BAND 10, 15, 20, 40 λ DIPOLE	138.50

ANTENNAS SINCE 1921

Communication and TV Antennas

telrex LABORATORIES

ASBURY PARK 42, NEW JERSEY, U.S.A.

For further information, check number 19, on page 126

The Turner '254'

THE MICROPHONE DESIGNED FOR THE HAM



Versatile, easy to operate—the new Turner 254 gives hams a dependable desk type crystal mike that's enginered for all amateur communications. It operates by a touch-bar on-off switch and lever-lock on-off switch. Output level—48 db. Response level 60 — 8,000 cps. Smart grey hammertone finish. One-piece die cast construction gives years of rugged service. And it's priced for every ham budget — only $14.10 net. See your Turner dealer right away, and get on the air with the new Turner 254.

THE TURNER MICROPHONE COMPANY

925 17th Street N.E., Cedar Rapids, Iowa

For further information, check number 20, on page 126

Spanish-American Hamfest

Mr. D. Chadwick Braggiotti, American Consul General in Sevilla, Spain, was the featured guest speaker at a special combined meeting of the Spanish-American Radio Amateurs and the Union Radioaficionados Espanoles, held in the Club La Rábida recently. Introduced by S.A.R.A. President, Johnnie Barrows K1ECT, the Consul General spoke first in Spanish and then in English to members of the group. He cited examples of radio amateurs' public services in all countries of the world and congratulated the Ham Radio fraternity for its selflessness in helping others. Mr. Braggiotti emphasized the fact that each American overseas is a representative of our country and government and should do his best to maintain harmonious relations with our foreign friends. He further stated that he was very pleased with the efforts of the Spanish-American Radio Amateurs in promoting good relations in accordance with the format of President Eisenhower's "People to People" program. Consul General Braggiotti's speech was particularly effective because he spoke fluently in Spanish. The entire presentation was tape-recorded for playback to a few SARA members unable to attend, and will be retained in the files of the group.

After President Barrows thanked the Consul General for his interesting speech, the group adjourned to a reception room and enjoyed "copas de vino" and "tapas" (drinks and snacks). At the reception Mr. Braggiotti was presented with a "Union Radioaficionados Espanoles" (U.R.E.) membership lapel pin by Senor D. Rafael Baquero, Provincial Radio Delegate for Spanish Radio District No. 7 and honorary president of S.A.R.A. Rafael's many certificates attest to his sustained amateur activity as EA7EM.

Attending the event with the Consul General were Vice-Consul and Mrs. Albrecht and Mr. Elmer Dorsey of Casa Americana and U.S.I.S. The Vice-Consul and Mr. Dorsey obtained a complete history of the Spanish-American Radio Amateur group since its inception in October 1958. S.A.R.A. is probably the only group of its kind worldwide, since both Spanish and American OMs are full members and officers. The group, founded by eight FCC licensed American amateurs, now numbers over 60 in Sevilla with membership almost equally divided between Spanish and Americans. Through the efforts of SARA's Sevilla members, groups were organized in Madrid and Rota. Senor D. Manuel Munoz (EA7JH), SARA Vice-President, states "Our group proves to all that there can be no boundaries nor barriers between people of different nations when they are sincere in their motives."

Although American radio amateurs are not presently authorized to pursue their hobby in Spain, they are hoping that the licensing problem will shortly be presented to Congress for legislative action. Legislation permitting operating agreements with other countries would "open the door" for amateur operation in Spain and many other countries of the world, and would be a terrific morale booster for the hundreds of FCC licensed amateurs who serve our country abroad. Regardless of their present "QRT" status the American hams in Spain have established lasting friendships with their Spanish counterparts, and proven their ability as "good-will" ambassadors in the tradition of the Amateur Radio fraternity.

Sara Sevilla Certificate

The Spanish American Radio Amateurs of Sevilla, Spain are sponsoring a certificate entitled "SARA Sevilla."

It will be awarded to any amateur station who has 20 QSO's with different stations in the province of Sevilla. These contacts may be made on any amateur band, any emission and there is no time limit on the award. Logs may be sent to the P.O. Box listed below, with the envelope marked "SARA Sevilla Certificate." The certificate will reflect the wonderful relationship here between the Spanish and American OM's and will depict scenes famous in Spanish history. Competition will begin on April 1st, 1960. The following EA7s in the province of Sevilla may be worked for the certificate: BW, CA, CB, CQ, CV, CY, DB, DC, DD, DG, DK, DI, EA, EJ, EL, EM, EN, EQ, EU, FE, FI, FM, FS, FT, GI, GV, HO, HX, HZ, ID, IG, IL, IM, IN, IQ, IV, JH, JK, JN, JM, JQ, JV and JX.

Address for certificate: "SARA Sevilla" P.O. Box 394, Sevilla, Spain.

Quincy, Ill. Hamfest

The Western Illinois Radio Club of Quincy, Illinois is

10 db GAIN

BASE STATION TO VEHICLE

-in both directions

STATIONMASTER
Cat. No. 201-509
Base Station Antenna

The STATIONMASTER consists of a number of collinear radiating elements fed inphase and encapsuled in a continuous weatherproof Fiberglass housing and withstands winds in excess of 125 m.p.h.

CARMASTER
Cat. No. 181-509
Collinear Gain Antenna

The CARMASTER is a new development in vehicular antennas. It consists of two half-wave and one quarter-wave radiating elements, excited inphase. Catalog No. 181-509 is designed for cowl mounting.

ELECTRICAL SPECIFICATIONS

Nominal input impedance	50 ohms
VSWR	1.5:1
Bandwidth	±0.5%
Max. power input	150 watts
Omnidirectional gain	5.8 db
Internal feedline	RG-8A/U
Frequency range	450-470 mc

Nominal input impedance	50 ohms
VSWR	1.5:1
Bandwidth	±1.0%
Max. power input	75 watts
Omnidirectional gain	4.2 db
Feedline	10′ of RG-58/U
Frequency range	450-470 mc

INCREASE YOUR RANGE BY 30%
YOUR COVERAGE AREA BY 75%

-with these advanced design antennas

Communication Products Company, Inc.
MARLBORO NEW JERSEY

Percentages listed are measured values

For further information, check number 21, on page 126



SAY MAN...

BRING THOSE SIGNALS IN!



GET AN "EASY ON YOUR BUDGET"

DOW PREAMPLIFIER

Signals 'pop out' of the noise!

Amateurs will hear signals they didn't hear before . . .

See your Electronics Dealer or write for catalog sheets.

HELP YOUR RECEIVER! The DKC-RFB Booster is a 50 to 70 ohm impedance matching "broadband preamplifier" guaranteed to increase the over-all gain by 1 to 6 "S" units on all bands (1.5 to 30mc). Worth dollars and dollars more to the amateur with low cost equipment desiring to improve sensitivity, work with DX, and bring up weak unintelligible signals. Designed for receivers up to the $300 class.

Not a gimmick . . . but a highly successful, tested and proven accessory, precision made, fully backed by Dow-Key's traditional Factory Warranty.

Compact: 1⅜"x1⅜"x2¼". Wt. 10 oz.



DKC-RFB only 10.75

DOW-KEY COMPANY • THIEF RIVER FALLS MINNESOTA

For further information, check number 22, on page 126

sponsoring a Hamfest, Sunday, June 19th at Eagles Alps Picnic Grounds near Quincy. Registration will begin around 0900 hrs. Mobiles will be in action on 3940 *kc* and 29600 *kc* on all highways leading to Quincy to help give directions. An outstanding selection of prizes will be headed by an Elmac AF-68 as main prize. A complete program and equipment display is planned with appeal for the whole family. An advance ticket prize will also be given. Food and refreshments will be available on the grounds. Tickets are price at $1.75 advance and $2.00 at the gate. Contact Hall Smith K9KOJ, 713 Washington St., Quincy, Illinois.

Central Kansas Radio Club

Sunday, June 5th, will mark the 13th Annual CKRC Hamfest, to be held in Kenwood Park in Salina, Kansas. Registration will begin at 9:00 A.M. for the 1:30 prize drawing. Although everyone is welcome, only licensed hams and their YL or XYL are eligible for registration. Bring a covered dish and silver service for your own family. Soda pop and coffee will be furnished by the CKRC. Dont miss this one! Prize Drawing . . . Hidden Transmitter Hunts . . . Bingo . . . Gabfests . . . Something for the entire family! Registration fee. $1.00. For further information contact: "Buz" Baer, WØJAS, 857 Shawnee Ave., Salina, Kansas.

Young Hams In Need

K6AQN, John L. Richard and his XYL would like to know if any groups or individuals would like to donate some transmitting equipment for a seventh grade school group anxious to get started in ham radio. They can be contacted at 44 Circle Road, San Rafael, California.

Caribbean Maritime Mobile

Bill Johnson K2ETI will leave New York City for a two week Maritime Mobile tour of the Caribbean. With him will be a Gonset G-50 and a halo antenna.

The operating schedule is expected to be 0000 to 0800 EST every night and possibly 1 to 3 hours before arrival at port.

Bill states that special QSL cards will be sent upon arrival home.

Curacao	May 17
La Guaira	May 18
Aruba	May 19
Kingston	May 21
Nassau	May 23
Port Everglades	May 24

Montreal Amateur Radio Club

At the Annual Meeting of the Montreal Amateur Radio Club, held January 27th, 1960, the following Officers were elected:

President: Mr. Rupert Grant, VE2QQ
Vice-President: Mr. Charlie Coorsh, VE2AFM
Vice-President: Mr. Ben Halickman, VE2AKT
Treasurer: Mr. Gordon Webster, VE2BB
Secretary: Miss Ethel Pick, VE2HI

New London, Conn. Hamfest

The Tri City Amateur Radio Council plans to hold their annual Hamfest at Ocean Beach Park, New London, Connecticut, on Saturday, May 14, 1960. Dinner tickets by advance reservation only. Men $5.00, Ladies $4.00. Reservations close May 7, 1960. Send reservations to: Hamfest, New London, Connecticut.

Dallas, Texas

The 30th annual convention of the West Gulf Division of the American Radio Relay League will be held at the Baker Hotel in Dallas on June 17, 18 and 19. This 1960 convention is sponsored by the GREATER DALLAS AMATEUR RADIO COUNCIL, representing eleven radio clubs in Dallas County. For more information contact: Harold Gross, W5RQB, Chairman, Prize Committee, West Gulf Division Convention, A.R.R.L., 3127 Fifty First Street, Dallas 6, Texas.

Saskatchewan Hamfest

The Regina Amateur Radio Association is sponsoring an official A.R.R.L Hamfest for Saskatchewan in Regina. Registration commences June 30th with club station VE5NN active on 3780 *kc*. There will be something of

[*Continued on page 97*]

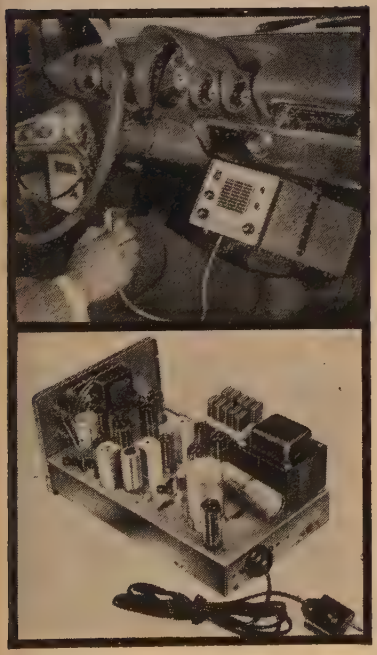


NEW! 10 for... 10 meters!

10 watts input . . . instant selection of 5 frequencies . . . a complete transceiver in one compact package!

The 10-meter Viking "Messenger" will qualify for matching funds, having been certified as meeting FCDA specifications.

VIKING *10-Meter Messenger* TRANSCEIVER



Ideal for fixed or mobile operation, the new 10-meter "Messenger" is a complete 10-tube (including rectifier) crystal-controlled transceiver! Superhet receiver offers excellent sensitivity and selectivity . . . with effective ANL, AVC, and positive-acting Squelch circuits. Transmitter section has a 7054 crystal oscillator coupled to a high gain 7061 final amplifier—puts out a clean, crisp well modulated signal! Other features: wide range pi-L network output circuit; automatic "transmit" indicator; push-to-talk ceramic microphone; self-contained power supply.

Pre-tuned for 29.4 to 29.7 mcs.—covers any 5 frequencies within a 300 kc segment of the 10-meter band. Compact and lightweight—exceptionally easy to install anywhere. 5⅜" high, 7" wide, and 11⅜" deep. For 6 V D.C. and 115 volts A.C., 12 V D.C. and 115 volts A.C., or 115 volts A.C. only. Dual voltage units will operate on D.C. voltage with just the switch of a power cord (furnished with the unit). Complete with power cords, tubes, microphone, and crystals for one frequency covering 29,640 kc, national calling and emergency frequency. Up to 4 additional crystal pairs may be installed for other frequencies of your choice for routine operation.

Cat. No.		Amateur Net
242-201	115 V only	$129.75
242-202	115 V and 6 V	139.75
242-203	115 V and 12 V	139.75

TUBE COMPLEMENT

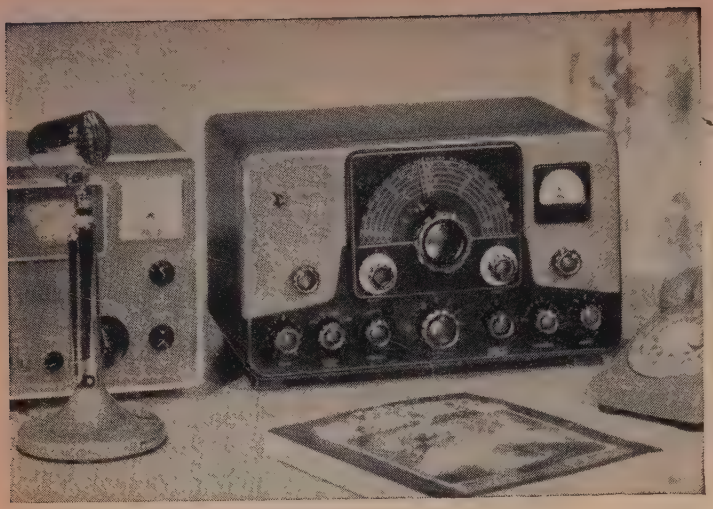
6BJ6	R.F. Amplifier	6AW8	Second Audio Amplifier, Squelch
12BE6	Mixer—Crystal Oscillator	12AB5	Modulator
6BJ6	I.F. Amplifier	7054	Crystal Oscillator
6AL5	Detector, AVC, ANL	7061	Power Amplifier
12AU7	First Audio and Speech Amplifier	12BW4	Rectifier

For detailed specifications and further information, write for Specification Sheet 737—yours on request!

E. F. JOHNSON CO.

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"RANGER" TRANSMITTER/EXCITER

This popular, superbly engineered transmitter also serves as an RF/audio exciter for high power equipment. 75 watts CW or 65 watts phone input. Built-in VFO or crystal control—instant bandswitching 160 through 10. 6146 final amplifier. Wide range pi-network coupling system will match antenna loads from 50 to 500 ohms—tunes out large amounts of reactance. Timed sequence keying. TVI suppressed. With tubes, less crystals.

Cat. No.		Amateur Net
240-161-1.	Kit	$229.50
240-161-2.	Wired and tested	$329.50

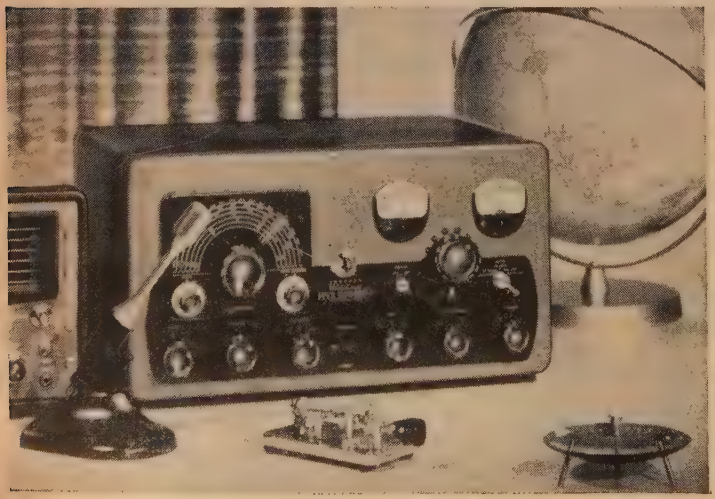
No matter what you expect from a transmitter...

"VALIANT" TRANSMITTER

Here's effective power, wide flexibility, and many unique operating features combined in a compact desk-top transmitter! 275 watts input CW and SSB (P. E. P. with auxiliary SSB exciter) and 200 watts phone. Bandswitching 160 through 10. Built-in VFO or crystal control. Final amplifier utilizes three 6146 tubes in parallel—wide range pi-network output. With tubes, less crystals.

Cat. No.		Amateur Net
240-104-1.	Kit	$349.50
240-104-2.	Wired and tested	$439.50





"FIVE HUNDRED" TRANSMITTER

More than one-half kilowatt o power plus outstanding operatin convenience! 600 watts CW inpu ... 500 watts phone and SSB (P.E.P with auxiliary SSB exciter)—instan bandswitching 80 through 10 meters All exciter stages ganged to VF tuning. High gain push-to-talk audi system. Built-in VFO or crystal con trol—VFO is temperature compen sated, highly stable. Wide rang pi-network output. Low level audi clipping—effectively TVI suppressed With tubes, less crystals.

Cat. No.		Amateur N
240-500-1.	Kit	$749.5
240-500-2.	Wired	$949.5

The world at your finger tips!



VIKING "KILOWATT" AMPLIFIER

This exciting unit is the only power amplifier available which will deliver full 2000 watts SSB* input, and 1000 watt CW and plate modulated AM! Class C final amplifier operation provides plate circuit efficiencies in excess of 70%. Continuous coverage 3.5 to 30 mcs. Excitation requirements: 30 watts RF and 10 watts audio for AM; 10 watts peak for SSB.

Cat. No.		Amateur Net
240-1000	Wired and Tested	$1595.00
251-101-1	Matching desk top, back and 3 drawer pedestal, FOB Corry, Pa.	$132.00

The FCC permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of two times average or more, depending upon individual voice characteristics.

you'll get more with a VIKING!



"6N2" THUNDERBOLT POWER AMPLIFIER

Rated at a solid 1200 watts P.E.P.* input SSB and DSB, Class AB_1; 1000 watts CW input, Class C; and 700 watts input AM linear, Class AB_1—with continuous bandswitched coverage on 6 and 2 meters. Wide range pi network output—effectively TVI suppressed—outstanding efficiency! Drive requirements: 5 watts in Class AB_1 linear, or 6 watts Class C continuous wave. Completely self-contained. With tubes.

Cat. No.		Amateur Net
240-362-1	Kit	$524.50
240-362-2	Wired	589.50



"6N2" TRANSMITTER

A compact VHF transmitter with instant bandswitching coverage of both 6 and 2 meters. Power input: 150 watts CW; 100 watts AM phone. Completely shielded and TVI suppressed. External VFO or crystal control—may be used with Viking "Ranger," Viking I, "Valiant," or similar power supply-modulator combinations. With tubes, less crystals.

Cat. No.		Amateur Net
240-201-1	Kit	$129.50
240-201-2	Wired	169.60

New Catalog

Your complete guide to amateur radios' most popular equipment. Includes details and schematics on all Johnson transmitters and amplifiers, as well as specifications on the complete line of station accessories, keys and practice sets, and antennas. Write for your free copy today!



COMING SOON . . . *the new Johnson filter type sideband transmitter with 60 db sideband suppression!*

FIRST CHOICE AMONG THE NATION'S AMATEURS

Viking

E. F. JOHNSON COMPANY • WASECA, MINNESOTA

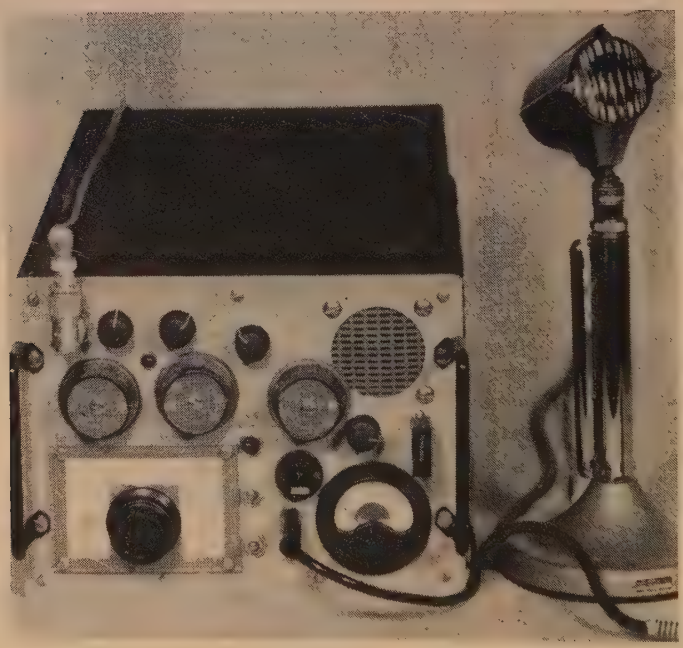
For further information, check number 24, on page 126

A Surplus "Communicator"

Roy E. Pafenberg

P. O. Box 844
Fort Clayton,
Canal Zone

. . . Conversion of the AN/ARC-1 to a 2 Meter Continuous Tuning Transceiver. . . .



The RT-18/ARC-1, major component of the AN/ARC-1 Aircraft Radio Equipment, offers many attractive possibilities as an amateur conversion project. The equipment, as supplied, operates from a 24 volt battery source and provides two-way radio telephone communication on any one of ten pre-set channels in the frequency range of 100 to 156 megacycles. In addition, a separate receiver section provides optional continuous monitoring of a single "guard channel" in the same band.

The physical size of the unit, 7½" high x 10⅞" wide x 19⅝" deep (exclusive of shock mounting base and front panel controls), makes it suitable for table top, home station use. Very good performance may be expected since the transmitter puts out an easy 8 watts and the receiver is of late World War II design. The conversion is actually not too complicated but a better picture of the task can be obtained by listing the retained, deleted and added features:

Retained

1. Basic transmitter and receiver circuitry.
2. Basic guard channel receiver circuitry.
3. Front panel meter switch, RF gain control, on-off switch, microphone and headset jacks and squelch switch.
4. Equipment case.
5. Existing 24 volt DC carbon microphone and control relay circuitry.

Deleted

1. Shock mount base.
2. Auto-Tune assemblies and drive motor.
3. Crystal bank and selector switch.
4. DC operated main power contactor.
5. Meter jack.
6. Existing front panel.
7. Plug-in dynamotor assembly.

Added

1. New front panel.
2. Audio gain control.
3. Internal speaker and line matching transformer.
4. Guard channel on-off switch.
5. Self contained *VFO*.
6. *VFO*-crystal switch.
7. Crystal socket.
8. *VFO* spotting switch.
9. *VFO* filament and B+ voltage regulator assembly.
10. Self contained, plug-in, B+, 24 volt *dc* control and 24 *ac* filament power supply assembly.
11. Pilot light.
12. Front panel extension of the three required tuning controls.
13. External 115 to 115 volt power line isolation transformer.

While conversion of this equipment is not recommended unless at least the "Handbook of Operating Instructions" is at hand, a brief description of the RT-18/ARC-1, contained in that manual, is offered for those considering the purchase of this readily available item. An external view of the unmodified set is shown in the photograph. All electrical connections, except the antenna, are made through a single plug on the rear of the set. A removable front panel cover protects the crystal units and the service adjustment controls. The case is secured by two Dzus fasteners at the rear of the unit. The main chassis supports a motor driven channel selector, just behind the front panel, and a plug-in 24 volt dynamotor mounted in a separate compartment. The central portion of the chassis contains the *if* and *af* circuits and mounts the individual receiver main-channel *rf*, guard channel *rf* and transmitter *rf* assemblies. Most power supply filter and control components are mounted on the dynamotor shelf and the front panel.

The receiver main-channel *rf* assembly consists of an *rf* amplifier stage, a mixer stage and a four stage crystal oscillator, frequency multiplier and amplifier section. This section generates a heterodyne frequency 9.72 megacycles below the carrier frequency for direct use in the receiver mixer and for use in the transmitter section as described later. Output from the mixer is a 9.72 megacycle *if* signal. All stages are gang tuned by an 8 section variable capacitor which is driven by the REC channel selector head.

The guard channel receiver *rf* assembly performs the same functions as the main-channel *rf* assembly, except that each stage in this section is tuned to a pre-set net frequency. The crystal unit for this section is located under a shield at the rear of the assembly. The 9.72 megacycle *if* output of this section is also coupled to the input of the *if* amplifier section.

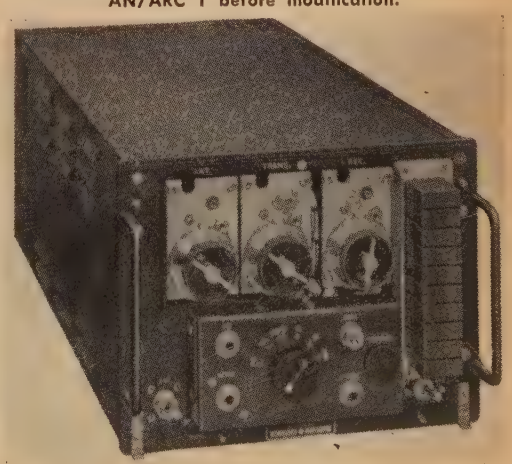
The *rf* portion of the transmitter is built as a separate sub-assembly, with certain components mounted on the channel selector casting. This section is excited by the receiver main-channel heterodyne signal which is 9.72 megacycles below the desired carrier frequency. The output of a 9.72 megacycle crystal oscillator is combined with the above signal in a balanced modulator circuit to produce the air frequency. This signal is amplified in a push-pull driver and a push-pull *pa* stage which is plate and screen modulated. All stages are tuned by ganged roller inductors driven by the TRANS channel selector head. The antenna tuning-loading coil and capacitor are driven by the ANT channel selector head.

The *if* amplifier section consists of three stages assembled on the main chassis. This section amplifies the output frequency signals (9.72 megacycles) of both the main-channel and guard channel *rf* assemblies.

The audio frequency circuits for both the transmitter and receiver are also assembled on the main chassis. The receiver circuits consist of a detector-amplifier stage, noise limiter and squelch stage, *avc* control stage and two parallel output stages with separate output transformers. The transmitter audio section consists of a microphone preamplifier stage, phase inverter stage and a push-pull class AB power amplifier stage to plate modulate the *rf* power amplifier stage.

The channel selector assembly is mounted directly behind the front panel and enables remote control of the transmitter-receiver. Since this assembly cannot be used in the conversion because of its outrageous *dc* power requirements, it will not be described.

AN/ARC 1 before modification.



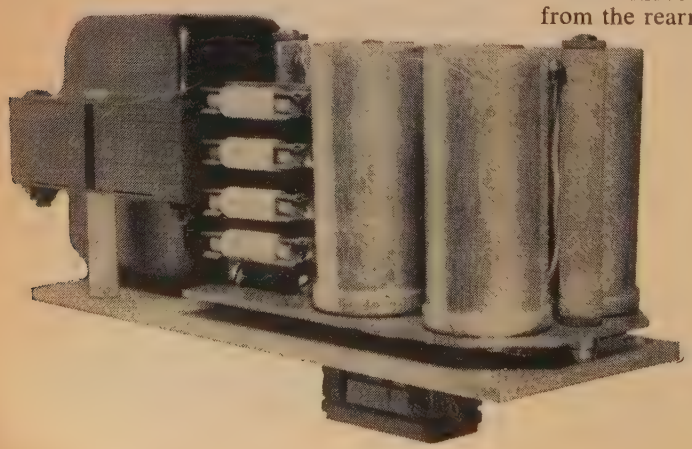
The crystal units used in the main-channel transmitter-receiver and in the guard channel receiver are type CR-1A/AR or CR-1B/AR units. Crystal frequencies for any given air frequencies may be determined by the following formula:

$$f_{c.u.} = \frac{f_c - 9.72}{18} \times 1000$$

where $f_{c.u.}$ is the crystal unit frequency in kilocycles and f_c is the air frequency in megacycles. The same formula applies when the *vfo* described in this conversion is used.

Power Supplies

A few words are now in order on the various considerations which led to the choice of power supply options specified. First, use of the autotune system was ruled out by the extremely high starting current required by the drive motor. The remaining 24 volt *dc* load consists of microphone and relay current, well within the 500 *ma* rating of replacement type silicon rectifiers. Since the conversion is greatly simplified if the existing filament wiring is not disturbed, 24 volts *ac* was deemed a fixed requirement. The B+ requirement is quite substantial, 350 volts (nominal) at 350 *ma,* and a conventional transformer-tube rectifier supply would be very bulky and heavy. Since it was desired to make the conversion as nearly as possible self contained, the compact silicon rectifier voltage tripler circuit was selected. The 115 volt *ac* input to this circuit must be isolated from the power line for safety reasons and because the B— is not returned to chassis ground in the receive condition. The ideal transformer for this application is a split primary, 115-230 volts to 24 volts at 8 to 10 amperes, which would fit in the available space on the plug-in power supply plate shown in the photographs. Such a transformer, wired as shown, should easily supply 115 volts at a little over one ampere and 24 volts at 3 to 4 amperes. The author could not locate a suitable unit, so a replacement type transformer was rewound to supply 24 volts at 4 amperes and an external plug-in isolation transformer was used in the model shown.



Conversion

Now for the actual conversion. Remove the unit from the shock mounted base, loosen the two single turn fasteners on the rear of the case and slide off the cover. Remove the main power and control connector, J-401, from the base; remove all wiring, clean up and plug into the transmitter-receiver. Discard the mounting base. The following steps separate the 24 volt filament circuits, which may be operated from *ac* from the control circuits, which require less than 500 *ma dc,* and terminates them on the dynamotor connector, J-105. These changes also provide 115 volt *ac* power, controlled by a front panel switch, to this connector. The 115 volt *ac* power cord is terminated on pins A1 and 5 on the external connector, P-101.

AC Power Modifications

1. Turn the unit on its left side and locate R-294, (730 ohm, 30 watt) which blocks access to relays K-103 and K-104. Remove the two screws securing the bracket on which this resistor is mounted and fold out of the chassis.

2. Remove the four flat head screws securing K-103, the relay toward the rear of the chassis. Remove all but one of the screws securing relay K-104 and twist the relay slightly to allow K-103 to be removed from the chassis. Reinstall relay K-104.

3. Locate the small gauge white-red trace lead on K-103 relay coil. Unsolder this wire and connect to pin 3 of J-105.

4. Locate the single heavy white wire which is connected to the other coil lug and to one contact of K-103. Unsolder this wire and connect to pin 5 of J-105.

5. Unsolder the two heavy white leads from the remaining contact of K-103. One of these wires terminates on one coil terminal of K-104 and the other on the rearmost terminal of the filament choke, L-153. Unsolder and discard both leads along with relay, K-103.

6. Remove the remaining heavy white lead from the rearmost terminal of L-153. Unsolder the other end of this wire from the adjacent microphone dropping resistor, R-156 (500 ohm 1½ watt). Discard this lead.

7. Remove the remaining heavy white lead from the coil terminal of K-104 referred to in step 5 above. Connect this lead to the rearmost terminal of the filament choke, L-153.

8. Locate antenna changeover relay K-101. Remove and discard the white lead which

connects one coil terminal of this relay to pin 3 of adjacent terminal board, E-106.

9. Form an insulated wire into the existing cable runs, to interconnect the now vacant coil terminals of relays K-101 and K-104; the previously referred to terminal of R-156 and pin 6 of dynamotor connector, J-105.

10. Remount the R-294 bracket assembly and dress wiring as required.

11. Run a heavy jumper from pin 2 of P-101 to pin 2 of J-105. This will permit use of an external 24 volt transformer if this option is selected.

Control Head And Front Panel Modifications

Carefully examine the front panel and control head wiring. It will be noted that, in addition to the antenna cable, two main cable runs enter this compartment. The Auto-Tune cable terminates on terminal board E-101. The cable to and including this board will be retained. The crystal socket assembly will be discarded. The antenna cable and jack will be retained along with all cabling and most of the jacks and controls on the jack panel assembly. The following steps cover removal of the front panel and Auto-Tune assembly and installation of a new control sub-panel.

1. Remove the screws mounting the antenna connector, J-103. Swing the jack free and reinstall the hardware on the jack to avoid loss.

2. Remove the toggle switch, S-104, without disturbing the wiring.

3. Disconnect the red wire from the lug protruding through the 2f oscillator shield at the front of the main-channel assembly and the ground strap from the crystal socket assembly where it is soldered at the oscillator shield.

4. Remove and discard the four screws on three sides of the jack panel which secure it in the front panel.

5. Remove the carrying handles, brackets for the mounting base and the five additional nickel plated screws around the edge of the front panel. Remove the front panel leaving the jack panel in place. Discard the brackets for the mounting base and reinstall the panel mounting hardware in the chassis frame for safe keeping. The front panel and crystal assembly may be discarded after removing one crystal socket for future use.

6. Remove and retain the knobs from the three Auto-Tune selector units. Loosen the set screws in the coupling at the rear of the receive selector head. Remove the three selector heads be removing the short Phillips head screw at the top of the rear plate and the lower two screws on the front plate of each unit. Carefully knock out the pins securing the gears on the rear of the antenna and transmitter selector heads. Retain these gears along with the knobs. The Auto-Tune heads may be discarded after removing the dial index pointers.

7. Remove the cable clamps on the front edge of the frame and on the channel selector casting. Remove the mounting screws of terminal board E-101 and clip all 13 wires leading to the channel selector components. Leave the cable from the main chassis attached to the board.

8. On the top side of the chassis, disconnect the coaxial transmission line (W-105) from the roller coil, T-105.

9. Loosen the set screws in the coupling at the channel selector end of the shaft for roller coil, L-113.

10. On the right side of the chassis, remove the cover to the main-channel *rf* assembly and unhook the spring from the pin on the ganged capacitor gear. Discard the coupling.

11. On the bottom of the chassis, disconnect coils L-117, L-118 and capacitors C-129, C-130 from roller coil T-104. Do not distort the coils in this operation.

12. Loosen the set screws in the coupling at coil T-104.

13. Remove the three channel selector casting mounting screws and carefully pull the channel selector assembly through the front of the chassis.

14. Remove and discard all Auto-Tune components from the main selector assembly casting, except roller coils T-104, T-105, drive assembly for roller coil L-113 and idler gears and hardware associated with the above components.

15. Carefully note method of assembly, then remove and retain all remaining components and tuning drive hardware mentioned in step 14 above.

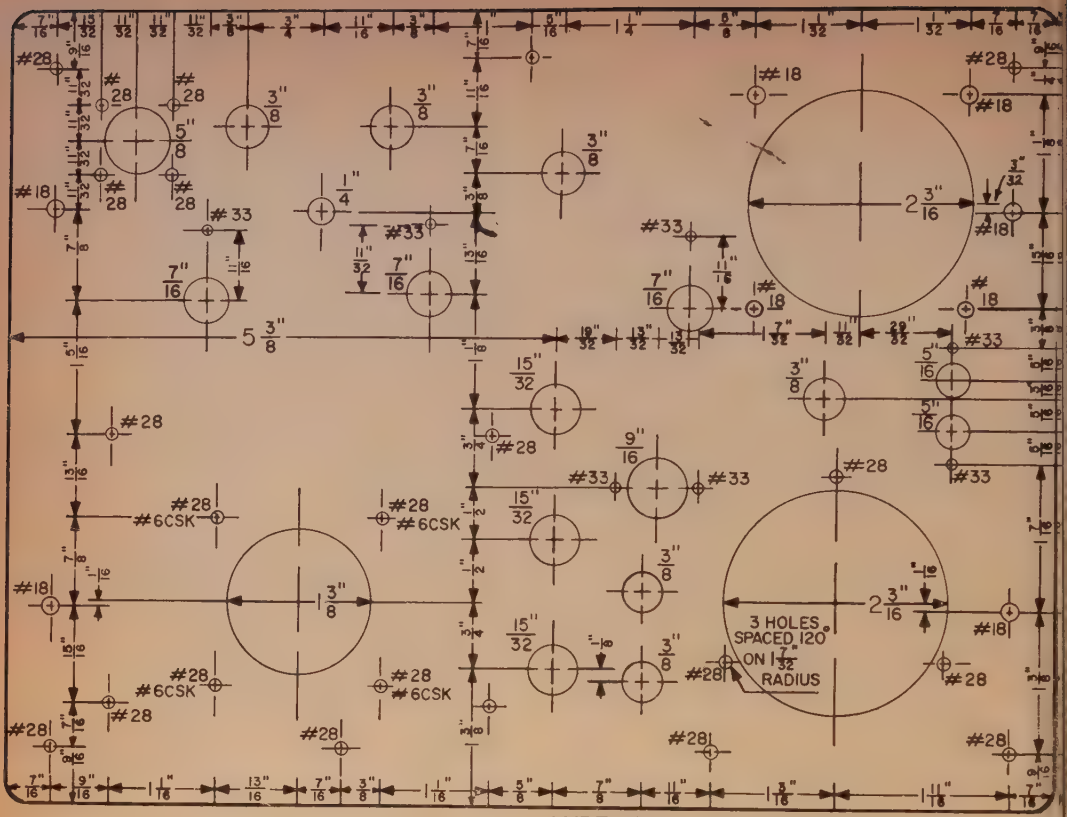
16A. Using a hack saw, cut the channel selector line shaft brackets off flush with the main casting. Using a large, coarse file, milling machine or shaper, evenly remove all projections from the front of the casting until the base plate measures 5/16" at the thickest points. Carefully remount all components and hardware removed in step 15 above.

Or

16B. Fabricate a new sub-panel from aluminum stock, using the old channel selector casting as a drilling template for precise location of the required holes. Mount the various parts and hardware removed in step 15 above. The idler gears coupling the various drives will have to be spaced out from the panel to permit proper mesh of the gears.

17. Locate the required position of the drive gears removed in step 6 above. The 76 tooth gear drives the antenna tuning components and the 62 tooth gear drives the transmitter tuning components. Accurately locate these centers, then drill and tap the panel for 6-32, being careful not to damage parts mounted on the back of the panel.

18. Secure three hubs from ¼" flexible shaft couplings. Accurately center two of these on the face of the two gears referred to in step



MATERIAL: 14 GAUGE ALUMINUM.
FINISH: MACHINE SANDED, PRIMED AND PAINTED 2 COATS SEMI-GLOSS BLACK.

Fig. 1—Front panel details.

17 above. Center the other on the capacitor drive gear of the main-channel *rf* assembly. Using a large, hot iron, sweat solder these couplings securely in place.

19. Fabricate two idler gear spindles from 9/32" aluminum or brass rod, drilled and tapped 6-32. Install 6-32 studs in the posts and mount on the panel. Dimension these posts so that proper mesh is achieved when the drive gears are mounted with the original hubs to the rear. The centers of the new couplings should line up with the locations of the old selector head drive shafts. Check the gears for smooth operation and adjust until this is achieved.

20. Remount the control sub-panel by reversing the procedures outlined in steps 8, 9, 11, 12 and 13 above. The upper left mounting screw should be reversed and used to mount a 2½" aluminum or brass, ½" hexagonal post. Drill this post and mount terminal board E-101 as shown in the photographs. Carefully check completed work. Check the control gears for 360° rotation and insure that component settings have retained their original relationships. Inspect solder connections for shorts. At this stage, the cable terminating on terminal board E-101, from the main chassis, should be the only wiring attached to it. Switch, S-104 and the antenna connector, J-103, should be free and connected to their original leads. The jack and control panel should be free and all original wiring intact, aside from the unterminated lug projecting from the 2f oscillator compartment as mentioned in step 3 above.

21. Fabricate the voltage regulator subchassis in accordance with fig. 3. The photographs show two electrolytic capacitors not shown in the diagram. These were required because the 500 volt units specified in the parts list were not available on the local market, and series connection of available capacitors was required. Mount the 7 and 9 pin sockets and the wire wound dropping resistor as shown. Mount the filament dropping resistors and wire in accordance with fig. 5, leaving the four external leads about 18" long.

22. Fabricate and finish the new front panel in accordance with fig. 1. The four *vfo* dial scale mounting holes, the four dial drive mounting holes and the dial drive clearance hole are located for mounting a dial and drive fabricated from a National Velvet Vernier assembly salvaged from a BC-375 tuning unit. If a commercial dial and drive is used, modify the panel layout accordingly. Mount the front panel temporarily, as shown in the photograph, to sim-

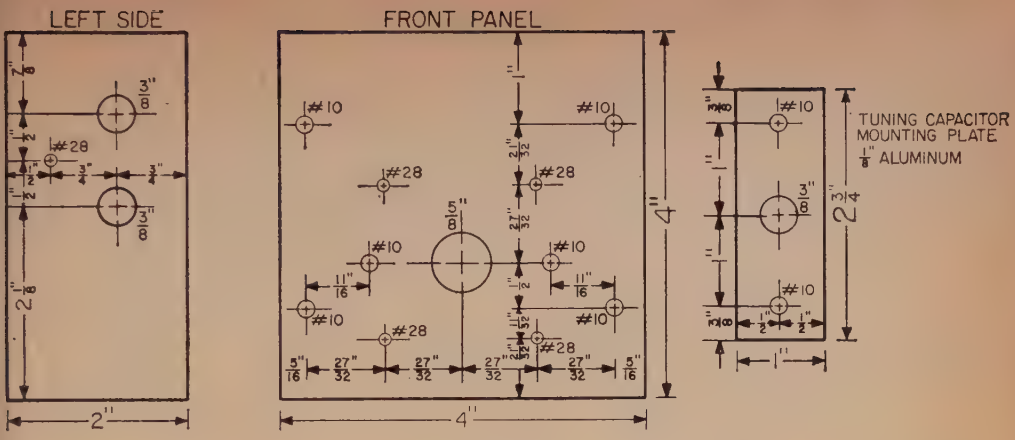


Fig. 2—Construction details for the vfo enclosure.

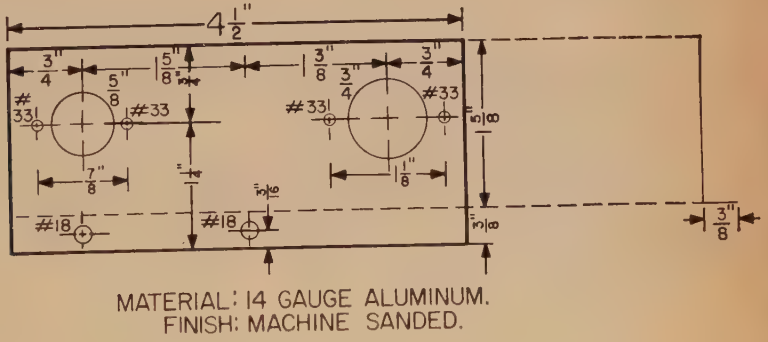


Fig. 3—Voltage regulator bracket.

plify assembly and wiring.

23. Drill and finish the front panel of the Bud #AU-1083 utility box and the *vfo* tuning capacitor plate in accordance with fig. 2. Mount the tuning capacitor to the plate and secure the plate, using ⅜" spacers between the rear of the panel and the mounting plate. Carefully remove one hub and coupling from an ICA #2142 flexible shaft coupling; notch or drill to accept the coupling screws on the rear of the National dial drive and mount in place of the former oversize coupling and stop plate. Using ¾" flat head, 6-32 machine screws, secure the dial drive and the *vfo* front panel to the rear of the main panel. Use ⅜" post spacers between the rear of the dial drive and the *vfo* front panel. Tighten the coupling set screws and check alignment of the capacitor shaft to insure smooth operation.

24. Install panel bushings, such as ICA #1250, to pass the three tuning dial shafts. Install the various other panel mounted components in their indicated locations. Install the output transformer on the speaker. This is T1 as shown in fig. 5 and is a line matching transformer. Ground one voice coil terminal and one side of both the primary and secondary of the transformer and connect the other secondary lead to the remaining voice coil terminal.

25. Fabricate a new 15" cable from RG-58/U, using the original connectors, between relay K-101 and connector, J-103, and plug into the relay. Using a length of two conductor shielded wire, run from the vicinity of V-122, along existing cable harnesses, through the cutout in the Auto-Tune panel. Dress an insulated lead from the vicinity of R-176, through the above mentioned cutout, leaving sufficient length to terminate on the new front panel.

26. Form these leads, the new antenna lead and the two existing harnesses into one cable, tape and securely clamp to the front panel support frame in the vicinity of the relocated terminal board, E-101. Form the wiring from

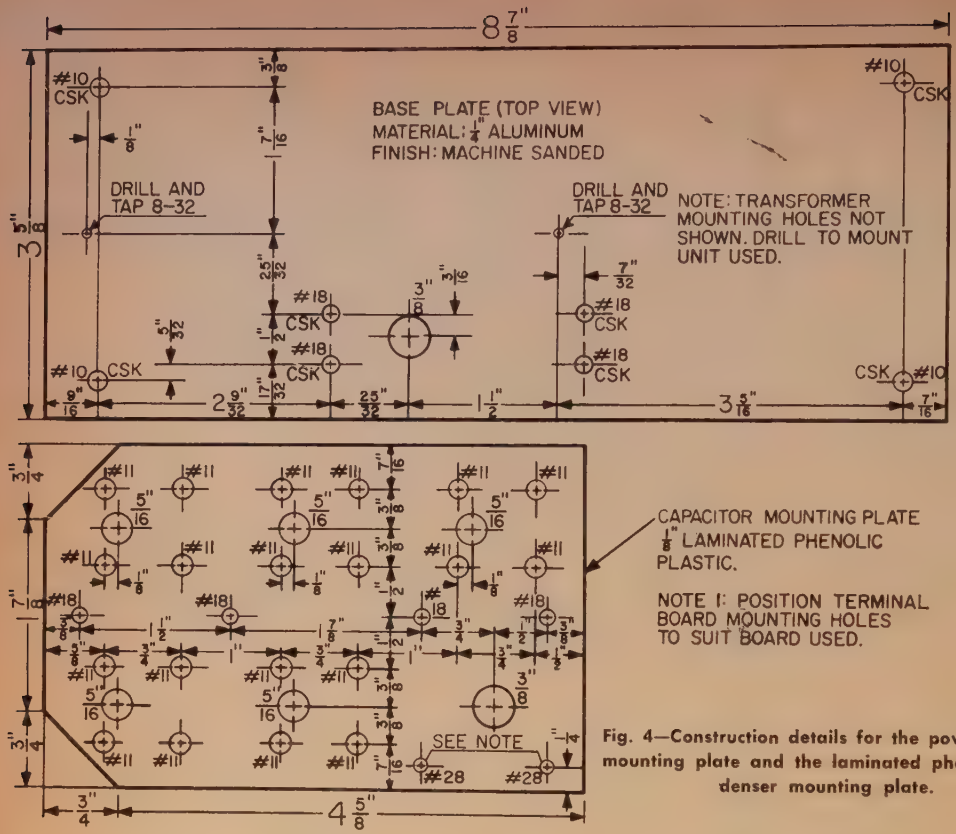


Fig. 4—Construction details for the power supply mounting plate and the laminated phenolic condenser mounting plate.

the voltage regulator sub-assembly in the channel formed by the Auto-Tune sub-panel and the chassis frame to the vicinity of terminal board E-101. Form the front panel control wiring harness to the new control locations, as shown in the photographs, shortening the leads as required to permit a neat installation.

27. The following changes should now be made in the wiring of the front panel components:

A. Former meter jack, J-101, is discarded and the leads run directly to the new meter.

B. Leads from the momentary contact switch, C-105 (original squelch switch). are reconnected to the new squelch toggle and S-105 becomes the new *vfo* spotting switch.

C. Former phone jack, J-104, is replaced by a shorting type and wired in accordance with fig. 5. The speaker matching transformer is connected to the shorting contact.

D. The sensitivity control, R-274, is replaced with a long shaft control of the same value.

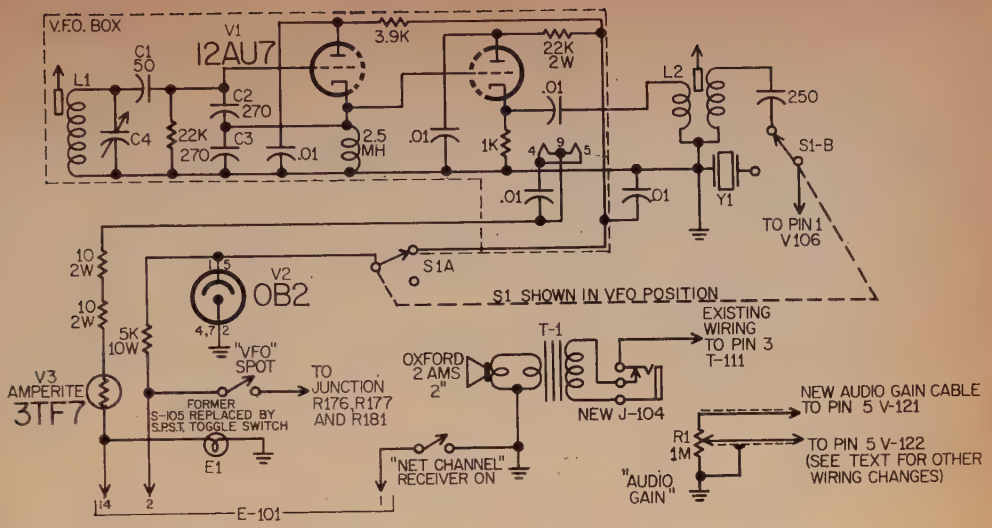
VFO And Additional Wiring

The previous conversion steps should have resulted in a clean job, with the only unterminated leads being the shielded pair from the audio section, the single wire from the vicinity of R-176 and the new leads from the voltage regulator sub-assembly. Since the cable terminating on terminal board E-101 leads to the main power connector, P-101, and many of the required circuit points are also terminated there; some of the wiring will be accomplished by installing jumpers on the mating connector, J-401.

1. Install wiring to control the guard channel receiver by running a lead from pin 1 of terminal board E-101 to one side of the new "Net Channel Receiver" toggle switch. Ground the other side of this switch. Complete the circuit by installing a jumper from pin 6 to pin 18 of connector J-401.

2. Connect B+ to the voltage regulator dropping resistor and one contact of the *vfo* spotting switch by running a lead between these points and hence to pin 2 of terminal board E-101. Complete this circuit by connecting a jumper between pin 15 and pin 19 of connector J-401. Connect the single insulated lead in the vicinity of R-176 to the junction point of R-176, R-177, R-178 and R-181. Connect the other end of this lead to the vacant *vfo* spotting switch terminal.

3. Connect 28 volts *ac* to the voltage regulator sub-assembly and the panel mounted pilot light by connecting the lead from pin 2 of the ballast tube to pin 14 of terminal board E-101,



L1—14 turns #22 wire on ¾" slug tuned ceramic form.
L2—Primary: 10 turns #26 enamel wire, close wound over ground end of the primary.
L2—Secondary: 40 turns #26 enamel wire, close wound on ⅜" slug tuned form.
C1, C2, C3—Silver Mica
C4—Hammarlund MC-20S (See text).
All other capacitors are mica.
T1—Thordarson 26S58.
S1—Mallory 3122J DPDT.
Y1—7460 kc to 7682.2 kc.
E1—Pilot Lamp 28 v, .07 amp bayonet base, GE #1829.

Fig. 5—VFO and front panel wiring.

and hence to one terminal of the pilot light. Ground the other terminal of this lamp.

4. Terminate the shielded pair cable on the new audio gain control. The shield should connect to the counterclockwise terminal and this terminal should be grounded. Examine pins 5 of the tube sockets for V-121 and V-122. Remove and discard the jumper between pin 5 of V-122 and V-121. Remove and discard the grid resistor R-227, side tone coupling components R-164 and C-173, and the tie points used to mount these parts. The only lead remaining on pins 5 of these sockets should be the coupling capacitor, C-242, terminated on the socket of V-121. Connect the lead going to the high side of the audio gain control to this terminal. Connect the lead going to the center arm of the control to pin 5 of V-122 and the shield to a convenient ground terminal.

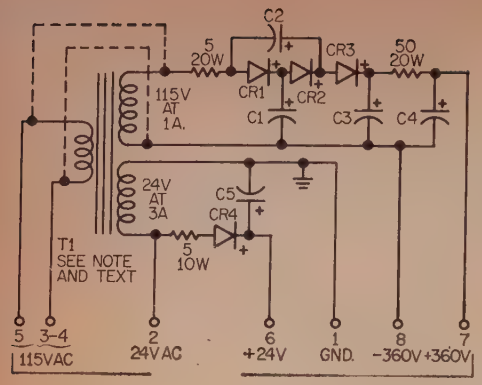
5. Drill, punch and finish the *vfo* box as shown in fig. 2. Mount the *vfo* components in the box and wire as shown in fig. 5. Complete as much wiring as possible before mounting the box. Panel mounting holes should be enlarged and the box secured to the front panel with 8-32 machine screws, lock washers and nuts. The *rf* output cable should be a length of RG-58/U cable. Parts placement, mounting and wiring must be in accordance with good *vfo* construction practice. The B+ and filament supply leads should now be connected to the *vfo*. The filament lead runs directly from the voltage regulator sub-assembly, while the B+ lead is routed through the switch, S-1A, as shown in fig. 5. Now, check your work in the *vfo* assembly. Reasonable care will result in a unit that is fully adequate for the purpose, while sloppy work and flimsy wiring will cause the output signal to wander all over the band.

6. Fabricate and mount the *vfo* output matching transformer, L-2, on a small angle bracket and secure under the speaker mounting screw nearest the *vfo*-crystal switch. Terminate the *vfo* output cable on this coil and wire it, the *vfo*-crystal switch and crystal socket, as shown in fig. 5. Bare, solid wire should be used, with the 250 mmf output capacitor mounted by its leads. Run a short, direct, temporary lead between the wiper arm of the switch, S-1B, and the lug protruding from the front of the 2f compartment of the main-channel *rf* assembly.

7. Carefully check all completed work. There should be no unterminated leads or loose components and cabling, lead dress and parts mounting should equal the commercial appearance of the original unit.

Power Supply Assembly

The power supply sub-assembly should now be fabricated. Regardless of which option is followed, the drawings apply since the transformer mounting holes are not shown and must be located to suit the unit selected. The capacitors specified for the output filter section are 500 volt units and, while 450 volt units might give satisfactory service, the safety factor was considered advisable in view of the heat generated in this compartment. While Sarkes-Tarzian type 80-M silicon rectifiers are shown in the photograph, the lower voltage M-500



T1—110-220 v split primary, 24 v secondary at 200 or more watts. High amperage surplus unit. Wire per solid lines.

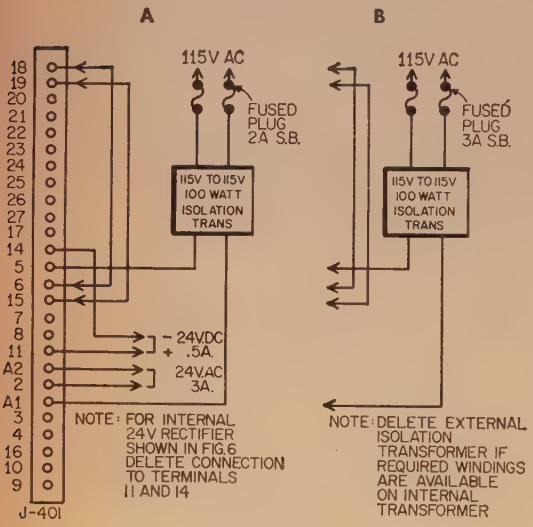
OR

115 v to 24 v at 4 amps. Thordarson 23V53 control transformer. Break wiring at dots and wire as shown by the broken lines. Use external 115-115 v isolation transformer.

C1—150 mf, 150 v, Sprague TVL-1430
C2—125 mf, 350 v, Mallory FP-140
C3,4—90 mf, 500 v, Mallory FP-187
C5—500 mf, 50 v, Mallory WPO-65

CR1, 2, 3, 4—Silicon Rectifiers, Sarkes Tarzian M-500

Fig. 6—Power supply wiring circuit.



Supply Option

A—External supply with internal B plus voltage tripler.

B—Internal supply with optional external isolation transformer.

WARNING: Use either internal or external isolation transformer. *Do not* connect the voltage tripler directly to the line.

Fig. 7—Power connection options.

units specified will be satisfactory in this application:

1. Remove the dynamotor assembly from the chassis and strip the mounting base. Fabricate the new power supply chassis plate, using the old base as a drilling template. Mount the plug-in connector, P-801, on the new base plate.

2. Cut and drill the plastic sub-panel as indicated in fig. 4. The silicon rectifier mounting board is not shown in the drawing, but should be dimensioned to fit the units used. Mount the components on the sub-panel and the transformer on the base plate. Wire the unit as shown in fig. 6. The sub-panel is secured by the resistor mounting screws which extend through the sub-panel, post spacers and are tapped into the base plate.

3. Check the power supply unit for wiring errors and proper termination of the plug. Plug the unit into the dynamotor compartment and secure with four flat head machine screws.

4. Make power connection to the set in accordance with the option selected. In the authors conversion, power is connected to pins A1 and 5 of connector J-401, and then plugged into an external line isolation transformer.

Test And Adjustment

Turn the completed set on and "smoke test". A few voltage measurements should disclose any obvious wiring errors. Plug in a microphone and the relays should close when the "push to talk" switch is closed. Switch the set to *vfo* position and tune the *vfo* signal in on a frequency meter or receiver with crystal calibrator. The frequency range of the *vfo* should be 7460 to 7682.2 kilocycles, with a small overlap at each end. Conventional techniques apply and, by adjustment of the plug in L1 and by removal and bending of plates in C4, the proper spread should be easy to achieve. Temperature compensation was not required in the original model. However, if warm up drift proves excessive, a few mmf of N-750 ceramic capacitor, compensated for by backing out the slug on L1, should do the trick. Fasten the back cover on the *vfo* assembly and adjust L1 if required.

Set the *vfo* in mid-band, throw the meter switch to MIX I_g and peak the meter by adjusting the slug in L2. This adjustment is broad

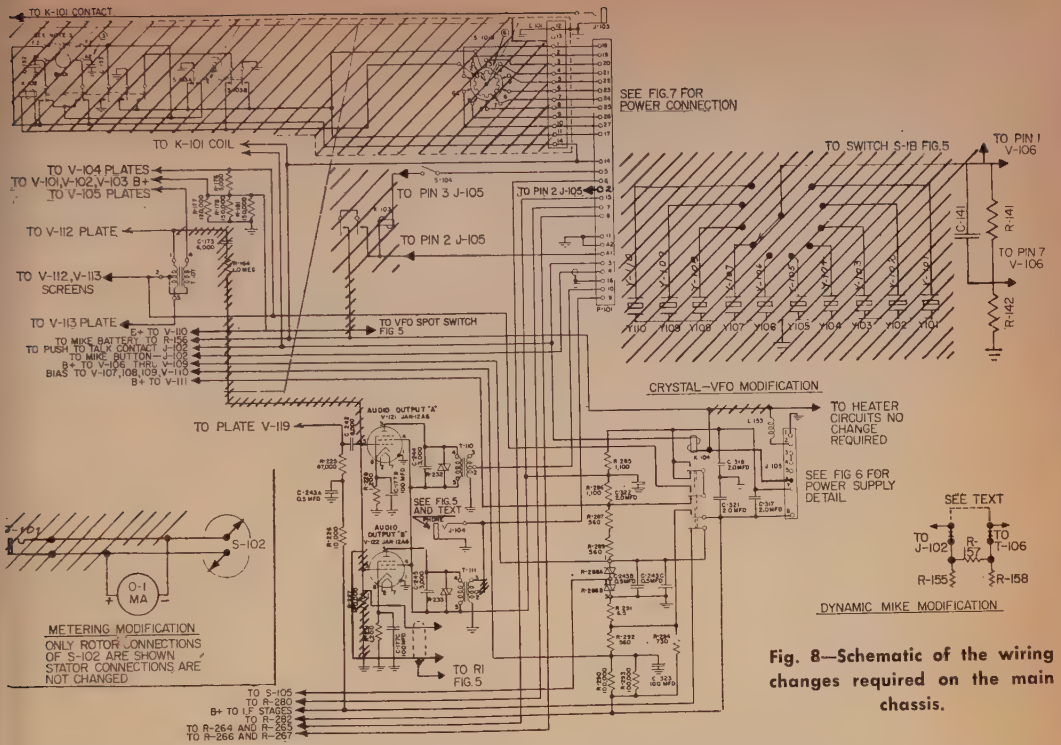


Fig. 8—Schematic of the wiring changes required on the main chassis.

and should hold fairly constant across the band. Connect an antenna, turn the squelch and guard channel receiver off and turn up the audio and *rf* gain controls. Tune the *vfo* across the band and peak received signals with the REC dial. Pressing the *vfo* spotting switch will enable exact zero beat with received signals. Turn on the squelch and the receiver should be quiet until the squelch is tripped. This should be accomplished by any signal appreciably above the noise level.

A preliminary check of transmitter operation should now be made. Connect a 6 to 10 watt lamp to the antenna jack. Set the *vfo* to mid-band, throw the meter switch to MIX I_g and peak the meter, using the REC dial. Throw the meter switch to PA I_g, press the mike button and adjust the TRANS dial for maximum meter reading. Turn the meter switch to PA I_k and adjust the ANT dial for between .6 and .8 *ma.* The dummy load should light to more than normal brilliance. Speak into the microphone and the lamp brightness should increase on voice peaks.

Now that the complete unit is checked out, reverse the front panel and mount in the normal position. Shorten the *vfo* output lead and run a ground strap from the crystal socket to the ground lug on the front of the 2f compartment. Cut appropriate length ¼" shafts and mount on the three drive couplings. The TRANS and ANT shafts should be secured in position by installing ¼" shaft collars directly behind the front panel bushings. Install control knobs and apply appropriate marking decals to the panel. Calibrate the *vfo* dial, using a frequency meter or communications receiver with crystal calibrator. Letter the scale, using decals or a lettering guide. The speaker grill in the unit shown was cut from a red plastic fly swatter. The original knobs were used on the three tuning controls and were dressed up by cementing convenient sized red plastic poker chips in the recess vacated by the Auto-Tune locking mechanism.

While this completes the conversion, a final check of transmitter alignment should be made. Tune the transmitter, into lamp load, for maximum output on a frequency near the center of the band. Turn the power off and, without disturbing the alignment, loosen the shaft couplings ganging the various TRANS roller inductors. Turn the set on and adjust each one for maximum output. Turn the power off and carefully tighten all couplings. The following chart shows meter readings that should be obtained:

CIRCUIT	METER READING, MA	MULTIPLIER
OSC I_g	0.10 - 0.20	1
MIX I_g (Reception)	0.20 - 0.60	3
MIX I_g (Transmission)	0.35 - 0.65	3
DRIVER I_g	0 - 1.00	1
PA I_g	0.30 - 1.00	5
PA I_k	0.60 - 0.80	100
MOD I_k	0.60 - 0.90	100

[*Continued on page 115*]

Adventures of the "SSB Argonaut"

Ted Henry, W6UOU
Box 64398
Los Angeles 64, Calif.

This miniature transmitter has given many a DX station an SSB first. You probably heard it from KB6, KS6, VR2, VS1, VS5, VS6, VK9 and many others. For those who would venture the task, construction data for the SSB Argonaut may be found in the Editors and Engineers Handbook, 15th edition, page 589.

The challenge to do what has previously been impossible is often irresistible. As enthusiasts of Single Sideband communication in general and of long distance voice communication in particular, we accepted the challenge to make the smallest possible voice transmitter which at the same time would be capable of reliable world wide communication.

What we wanted to do was first of all demonstrate just what could be accomplished with present day miniature components, while at the same time we continued our missionary campaign extolling the unequalled virtues of single side band transmission for voice communication. The result was a complete 35 watt filter type SSB transmitter including 110/220 volt *ac* power supply—total weight 11½ pounds and measuring 6 inches high, 9 inches long and 5 inches deep.

Because of its small size and light weight we felt it would be feasible to send it from country to country where no SSB activity had previously existed. Inasmuch as we planned for it to wander the world seeking the "Golden Fleece" of DX communications, we called it the "Argonaut" after the mythological gold seekers of ancient Greece. Apparently the name was well chosen since it has figuratively struck gold in every country it has visited. And already it has wandered so far it has dwarfed the puny voyages of the original Argonauts.

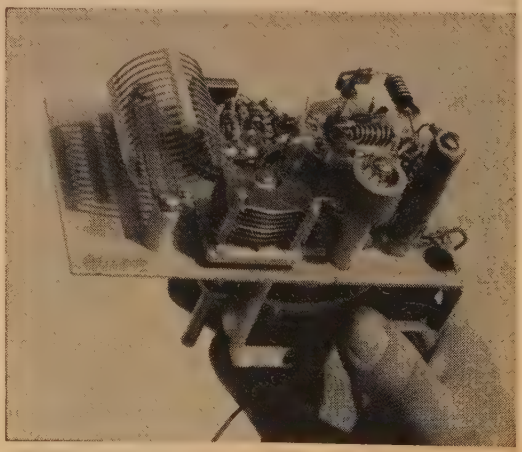
The photographs will tell a great deal about the physical layout of the Argonaut. The purpose of this article is not to encourage others to try to duplicate the construction of the transmitter. The very process of miniaturization introduces such trying design problems that we do not feel that the average amateur will want to tackle the job.

Construction

In a general way we can point out that it is a crystal controlled, single band transmitter using a 500 kilocycle mechanical filter for suppression of the unwanted side band and a Crosby balanced modulator for carrier suppression. It uses subminiature tubes throughout the exciter with a 6CL6 for the driver stage and a 6524 running AB2 in the final. The power supply will operate from 110-220 volts 50-60 cycles and employs silicon rectifiers in two separate bridge circuits to supply 450 volts at 125 *ma*, 300 volts regulated at 30 *ma*, 125 volts at 120 ma and 6.3 vac at 7 amperes. The average peak power input of the final is 450 *vdc* at 90 *ma* or roughly 40 watts.

Testing

Final construction of the rig was completed on July 23, 1957 and Bob Adams, W6AVA, who personally designed the rig and put it together, placed it on the air that night. It was a truly exciting moment for us all since a very great deal of planning and many weeks of work had been gambled in the hope that a really effective filter type SSB rig could be reduced to such modest proportions. It was a long eve-



Forty watt final linear amplifier with Pi-network output.

ning and a highly rewarding one. Some three dozen QSO's later at two o'clock in the morning we closed down knowing that "Argonaut" was a success. We had contacted amateurs in seven countries including such DX contacts as Win ZL3DX, Cyril VK3AEE, Scotty KAØSC and Volt DU7SV. Reports were all Q5 ranging from S-5 to S-8, and reactions to side-band suppression and audio quality were all favorable.

DXpedition

We were, at that time, planning my DXpedition to Samoa and we decided to take the "Argonaut," as a spare in case of emergency. During our twelve thousand mile trip to Samoa and back, our KWM-1 worked so beautifully that we had no occasion to use the "Argonaut," but on the way back we attended the Honolulu SSB dinner and there set up the Argonaut's first adventure.

Jim Keefer, KH6KS, was planning a trip down to Canton Island and wanted to put that spot on SSB for the first time but unfortunately did not have a transmitter suitable for transportation by plane. It was a case of love at first sight and the Argonaut's first assignment was settled. On September 21, 1957 KH6KS/KB6 went on the air with a resultant flurry of excitement throughout the 20 meter band. In a week of operations on his off work hours, Jim gave some 200 stations their first SSB contact with Canton Island. Around the 1st of October Jim secured on Canton Island and flew back to his home in Honolulu. At that time we prepared the Argonaut's second adventure.

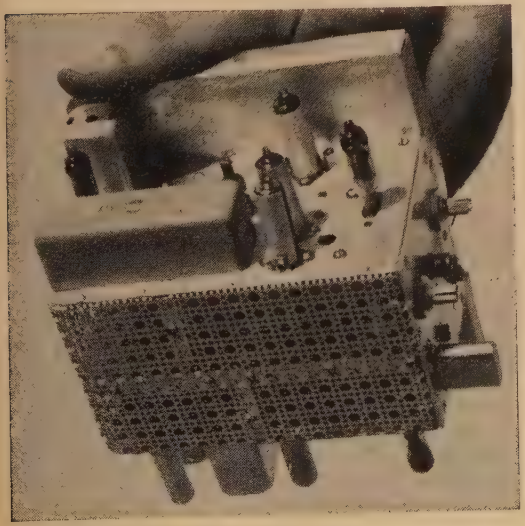
Lyell Louttit, VS6BE, who is well known for his SSB activity from Hong Kong, had offered to expedite shipment of the Argonaut to various rare spots in the Orient. So off to Hong Kong flew the Argonaut via Pan American Airways. Lyell checked out the unit in Hong Kong with satisfactory 5 and 9 reports and quickly dispatched it to Labuan, British North Borneo and thus by private plane to Jim Tierney, VS4JT, in Sarawak and finally by car over jungle roads to Tony Tipple, VS5AT, in Brunei. There on November 14, 1957 another SSB first was established when the Argonaut at VS5AT began operation.

In the two years that have elapsed since then the Argonaut has become something of a legend with apparently very few realizing exactly what type of rig it really is. One successful DX operation has followed another in a routine of trouble-free adventures which logic would declare to be impossible but which our ears have all too gladly proven to be true.

After VS5AT followed VS1HS, Harry Goodwill in Singapore, then VS2DB now 9M2DB in Malaya, then VK9LE and VK9AJ on Cocos-Keeling Island in the Indian Ocean. Next the Argonaut was off for still another memorable SSB first with Stan Davies, VK9AD, on Norfolk Island. VS1BB/ZC5, Barry Bonser, was as happy to have the Argonaut as we were pleased to have it along when British North Borneo first experienced amateur SSB communications. From Borneo to Ceylon is a fair hop but with Ken Denman, 4S7KD, in charge it was no problem at all. The next stop was far, far off the regular air routes down to the Maldives in the Indian Ocean at VS9MA.

By this time a year had passed and this tiny rig which had seemed so inadequately small, so impossibly underrated for the job we were asking it to do, was actually performing so magnificiently that we began unconsciously to assume that nothing could go wrong and that it

[*Continued on page 125*]



Complete filter exciter using sub-miniature tubes.



The 110-220 vac power supply. It delivers 450 volts at 125 ma, 125 volts at 120 mg, 300 volts regulated and 6.3 volts for filaments.

What About Sideband-Suppression And Bandwith Reports?

Wilfred M. Scherer, W2AEF

Poor sideband suppression reports are often given because many operators do not actually know how well their receivers are able to reject an unwanted sideband signal. The author describes a simple method of checking a receiver in this regard without the employment of special test equipment. Helpful data is also given on how to use a receiver for making and evaluating sideband-suppression and bandwidth observations.

It is not at all uncommon to hear an SSB operator giving out sideband suppression or bandwidth reports which either do not agree with what you yourself observe, or which are in disagreement with reports from other operators. In all probability this may stem from the fact that many of the SSB gang do not know the capabilities, or limitations, of their receivers in this regard.

With this in mind, it might be well to point out some of the pitfalls which may be encountered, and also to demonstrate how easy it is to check one's receiver characteristics without resorting to any elaborate test equipment; in fact, all that is required is a steady test signal which can be that from a crystal calibrator, a carrier from another station, or an inserted carrier from your own transmitter. The actual test procedure will be explained a little later in the text.

Rejection Capability

The rejection capabilities of most SSB receivers generally are good at frequencies which are removed from the carrier frequency by a degree of 500 cycles or more on the sideband to be rejected, but at points closer to the carrier frequency, the rejection capability is degraded considerably. This, of course, depends on the filter skirt selectivity and the position of the inserted *bfo* carrier, or on the alignment and merits of the phase shift networks in the phasing type of slicer. In these cases, even if a transmitter were capable of *complete* suppression at *all* frequencies on the *unwanted* sideband, an audio frequency of 500 cycles or less which is used to modulate the transmitter on the *wanted* sideband, would appear as an *unwanted* sideband signal on the receiver.

Take the 75A4 for example. Most operators set the Passband Tuning at 1.5 *kc* for use with the 3.1 *kc* filter. If this is done on the lower side, the *bfo* carrier frequency will be 456.5 *kc*, and it will be positioned at the edge of the passband as shown in fig. 1. Suppose our transmitter, capable of *complete* unwanted *lower* sideband suppression, were modulated by an audio frequency of 300 cycles transmitted on the *upper* sideband. Reference to the filter curve will show that the maximum possible attenuation on the receiver at 456.8 *kc* (300 cycles higher than the carrier of 456.5 *kc*) will be about 25 *db*, so the S-meter, or the level of the audio beat, will respond accordingly, and the signal will *appear*

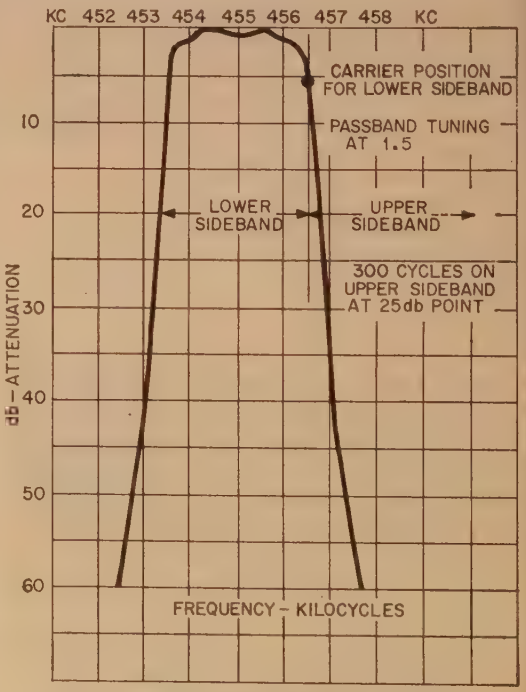


Fig. 1—Typical Passband setting for the 75A4.

as if it were an *unwanted lower* sideband signal having only 25 *db* of suppression, even though no signal is *actually* being transmitted on the *lower* sideband! Thus the operator of our mythically perfect SSB transmitter could receive a report of inferior sideband suppression, especially if his voice produced good low frequency response.

In this regard, it should be pointed out that the vowel sounds of the voice are those which produce the most energy, and that they occur in the audio frequency region below 500 cycles. If, in the case just cited, the transmitter were voice-modulated, the *apparent* unwanted sideband would sound like "growly" audio (mostly low frequencies), while audio frequencies above about 500 cycles would be way down, if heard at all, the latter being more nearly the true picture.

Now, if the Passband Tuning is set out to 1.75 or 2 *kc*, the carrier will be further out on the filter skirt, and the receiver accordingly will be more capable of opposite sideband rejection near the carrier; however, when this is done, the low frequency response on the *wanted* sideband also will drop off and the audio quality will tend to thin out. At the same time, this decrease of low frequency response *in the passband* could make the actual suppression appear better than it really is at frequencies which are closer than 500 cycles or so to the carrier. This can further obscure the true picture, although the degree of error in this situation may not be quite as detrimental. Another course to follow is the employment of a steeper-skirted filter such as may be had with the 2.1 *kc* or narrower band filters, in which cases the carrier may be positioned closer to the filter passband before the rejection capabilities seriously deteriorate.

It is also worthy to note that, in any case, since the voice covers a *band* of frequencies, as does the selective system of the receiver, the degree of suppression can be observed and expressed only as it is related to a *range* of frequencies, unless a single modulating frequency is transmitted, in which case the amount of suppression is related to the specific modulating frequency only.

In general, a good overall appraisal may be made when the receiver is capable of almost complete opposite sideband rejection at all frequencies well up to the carrier frequency (within 100 cycles or so). Let us now see how our receiver will perform in this respect.

Checking Lower Sideband Rejection

To check the *lower* sideband rejection capabilities, or the response of the *passband* on the *upper* side, the procedure is as follows:

1. Set the receiver for *upper* sideband operation.

2. Tune in a steady test signal for zero beat. The test signal may be obtained from one of the sources suggested earlier in the text (2nd paragraph).

3. Note the dial reading. If a "zero-set" is available, accurately line up the hairline with a reference point on the dial.

4. Tune the receiver towards the *low* frequency side of zero beat, and watch the S-meter readings at the various frequency deviations from zero out to about 5 *kc*. If the receiver dial cannot be read in small enough increments, the frequency deviations may be determined by ear according to the resulting beat note. The meter readings will indicate the response at different points along the *passband* on the *upper* side.

5. Slowly tune the receiver back towards zero beat, and on to the *high* frequency side where the S-meter readings will now be indicative of the *attenuation* on the unwanted *lower* sideband.

If no signal is found at any frequency on the *high* side of zero beat, rejection of any signal on the *lower* side will be complete. This rarely will be the case, unless the *bfo* carrier is positioned quite far out from the passband, or unless the filter skirt is really vertical. In the *average* case it will be most likely that some indication of response may be found (attenuated up to about 20 *db*) somewhere in the region within 500 cycles next to the carrier (zero beat). If such unwanted sideband response is limited to within the 100 cycle region, the sideband selectivity of the receiver is excellent and above par, but if it extends beyond the 500 cycle region, the selectivity may be considered inferior.

Checking Upper Sideband Rejection

Rejection of an unwanted *upper* sideband, or the passband response of the wanted *lower* sideband, may similarly be checked by reversing the direction of the frequency excursions as set forth in the preceding steps; i.e., set the receiver for *lower* sideband reception, and tune to the *low* frequency side of zero beat for checking the *upper* sideband rejection, or tune to the *high* frequency side for the passband response on the wanted *lower* sideband. The frequency excursions from zero beat appear to be stated in the wrong direction, don't they? Well this is the way it works, so don't worry about it.

If the receiver does not have an S-meter, the above steps may be conducted while aural observations are made instead. In fact, this sometimes may be a preferred method, since it is our ear, rather than the S-meter, which transmits intelligibility to the mind, and thus makes us conscious of undesired signals.

When the aural method is used, turn up the audio gain, turn off the *avc*, and crank down the *rf* gain (in many cases the latter will sufficiently disable the *avc*). When the *rf* gain then has been set for a comfortable listening level for the *wanted* sideband, a check at any frequency of the *unwanted* sideband will indicate an attenuation of 20 or 25 *db* when the signal level has dropped to bare perceptibility.

Either one of the above methods also is a convenient means to employ for finding the best

setting of the Passband Tuning in the case of the 75A4 (for the particular filter in use), the best position for a variable low frequency filter such as in the Drake 1A receiver, or for the proper setting of the *bfo* in other receivers. You can also see how well a phasing type of slicer performs in regards to unwanted sideband rejection.

Another point to consider, either during normal operation or when suppression is to be checked, is that you cannot expect to experience good suppression of a received signal (to the ear, and this is where it counts) when the *rf* gain is wide open with full *avc* action. This may be demonstrated by checking the receiver's rejection capabilities by *ear*, as described above, but this time run up the *rf* gain with the *avc* on. Full *avc* action can also subject reception to annoying adjacent channel crud. In the case of the 75A4, the rejection tuning also will be far more effective when the *avc* action is minimized.

Signal Sideband Suppression

Now that we know what the receiver can or cannot do, we can check the sideband suppression of an SSB signal by proceeding as follows:

After the signal has been tuned to frequency on the *wanted* sideband, open up the audio gain nearly full on, disable the *avc*, and turn down the *rf* gain to a comfortable listening level. Then switch the sideband selector to the *opposite*, or *unwanted*, sideband position (with the 75A4 this means placing the Passband Tuning at the proper point on the opposite sideband as determined from the simple test procedure just conducted), and make your observations by ear, taking into account the receiver characteristics.

If the unwanted sideband frequencies are barely audible, the minimum degree of indicated suppression is about 20 to 25 *db*, while inaudible signals will indicate suppression by a larger amount. As pointed out earlier, many receivers are somewhat deficient in their ability to completely discriminate between sidebands up to about 500 cycles from the carrier frequency, so some low-level low audio frequencies may be heard regardless of whether or not the unwanted sideband is suppressed in this region by the transmitter. However, if the resulting signal is quite understandable, it may be reasonable to assume that the overall suppression at the transmitter is accordingly inferior. On the other hand, if the receiver has poor sideband selectivity beyond about 500 cycles, an understandable signal may result even if the transmitted sideband is completely suppressed.

Aural observations usually are preferable to those made with the S-Meter, because the latter is not able to discriminate between frequencies or adjacent channel signals; whereas, the aural method can tell us the extent of the frequency range (according to the resulting audio beats) over which unwanted signals can be found, and whether or not the undesired signals are understandable. The S-Meter can be more useful for the determination of a specific value at a single modulating frequency.

If a receiver is being used which requires retuning to frequency when sidebands are changed, or if you have a receiver, such as the KWM-1, which is capable of operation on only one sideband, leave the receiver set, and have the transmitter operator switch to the opposite sideband instead. Then, assuming that the transmitter's suppression is the same when either lower or upper sideband is used, the necessary observations may be made with the receiver.

The minimum degree of tolerable suppression probably could be argued until the cows come home; however, from a practical standpoint, it may be found that any amount of suppression, due to the combined capabilities of the receiver and transmitter in any particular situation, will be adequate if it will permit simultaneous separate lower and upper sideband QSO's on the same frequency without undue interference between each QSO. (Incidentally, we should have more of such operation, especially on 14 *mc.*) This may require an overall degree of 20 *db* or more of suppression (receiver plus transmitter), depending on the existing conditions such as the relative signal levels of the *wanted* sidebands. In this connection, the next time you get stuck in QRM, don't holler about it or QSY to another spot which may be just as bad, simply get on the *same* frequency as that of an interfering station, and carry on the QSO using the opposite sideband. You'll be surprised at what SSB really can do! The reason why operation is usually best carried out on the same frequency, when sidebands are switched, should become evident from the discussion which follows.

Bandwidth

The question may be raised, "Instead of switching the receiver's sideband selector when the other fellows suppression is to be checked, why not just tune the receiver to the unwanted side of the carrier frequency?" Well, let us see what happens when this is attempted. If we are listening to a signal transmitted on the *lower* sideband, and then tune the receiver to the *upper* side of the carrier frequency, we can still find signals even if the *upper* sideband frequencies may be *completely* suppressed at the transmitter. This can be explained as follows:

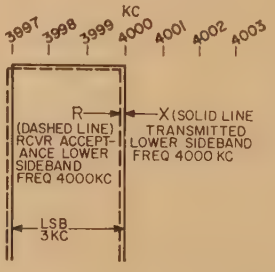


Fig. 2—Idealized 4 mc LSB signal with corresponding idealized receiver passband.

At fig. 2 an SSB signal having a carrier fre-

quency of 4000 *kc* with a transmitted bandwidth of 3 *kc* on the *lower* sideband is represented by curve *X*. If the receiver has an identical bandwidth characteristic, the receiver's acceptance will cover the same spectrum as the transmitted frequencies when the receiver is tuned to the carrier (the suppressed basic signal frequency) while the receiver is set for *lower* sideband reception. This is indicated by curve *R* which

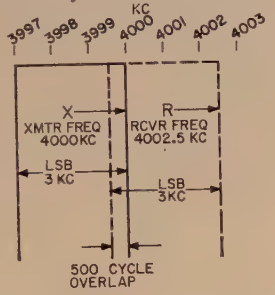


Fig. 3—Receiver set at LSB with carrier frequency tuned to 4002.5 kc. Transmitted frequency is 4000.0 kc.

actually superimposes on curve *X*. Now look at fig. 3. Here the receiver is tuned to 4002.5 *kc*, or 2.5 *kc* away from the SSB carrier on the upper side. From the representative curves it will be seen that the 3 *kc* bandwidth range of the receiver acceptance curve *R*, now includes 500 cycles of the transmitted frequencies, from 3999.5 to 4000 *kc*. Since the receiver is capable of accepting these frequencies, any transmitted frequency in this range on the *lower* sideband will show up on the receiver, even though it is tuned to a point which is 2.5 *kc* out in the unwanted *upper* sideband. This then makes it *appear* as if the upper sideband is not suppressed, and that the signal occupies a total bandwidth of 5.5 *kc* (lower sideband of 3 *kc* plus upper sideband of 2.5 *kc*) instead of the actual transmitted bandwidth of 3 *kc* on the *lower* sideband only. Similarly, if the receiver were tuned to almost 4003 *kc*, the total bandwidth would *seem* to be nearly 6 *kc*.

From this it may be seen that not only can erroneous suppression reports be given, but that also incorrect bandwidth reports may result when the Vertical-Horizontal method of SSB signal reporting (as suggested by W2KR in the Sidebander) is used.

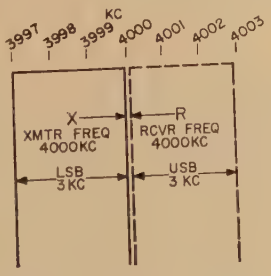


Fig. 4—LSB signal with a carrier frequency of 4 mc. Receiver set at USB with the carrier frequency also 4 mc.

Now, if we switch the receiver's sideband selector for *upper* sideband reception, and tune the receiver to the carrier frequency, no signal will be heard, because the receiver acceptance covers only the *upper* sideband range from 4000 to 4003 *kc*. (See curve *R*, fig. 4.) If the receiver is next tuned to 4002. 5*kc*, still no signals will be found, since the receiver acceptance is now 4002.5 to 4005.5 *kc*, as indicated by curve *R*, fig. 5.

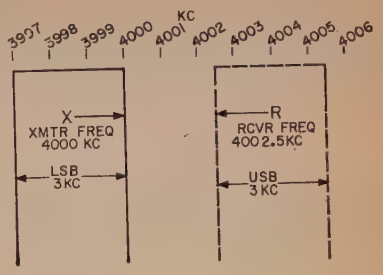


Fig. 5—Receiver passband and transmitted signal offset by 2.5 kc.

So far the representative curves have been based on ideal selectivity characteristics, for both transmitter and receiver, with perfectly vertical filter skirts. In practice, the average receiver acceptance (including that of the phasing type of slicer where the phase relationships can deteriorate rapidly below three or four hundred cycles) may be more like that shown at fig. 6.

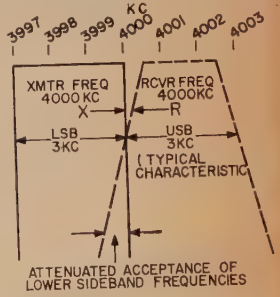


Fig. 6—Although no signal is actually transmitted on the USB, the receiver accepts an attenuated portion of the LSB signal.

In this case, when the receiver is tuned to 4000 *kc*, for the upper sideband, low frequency modulating signals from the wanted *lower* sideband will be accepted by a degree which is dependent on the slope of the selectivity skirt. This possibility was also shown earlier in the text in connection with fig. 1.

Thus it may be necessary to tune into the *upper* sideband region by an amount greater than several hundred cycles (as determined earlier from the simple test procedure), before a reasonably accurate appraisal of sideband suppression can be made. At the same time a relatively honest observation, within the same limits, may be made of bandwidth occupancy for our "H-V" reports.

Checking Bandwidth

The correct procedure to use, when the receiver is tuned over the signal region, is as follows:

Set the receiver sideband selector for the *wanted* sideband, and tune in the signal to the basic frequency. Then change the sideband selector for the *unwanted* sideband, and tune the

[*Continued on page 115*]

Results of the 1959 CQ World Wide DX Phone Contest

Frank Anzalone, W1WY

TOP TEN
All Band Single Operator
4X4GB—829,864

VQ4DT—640,252	CX2CO—491,052
CN8JF—566,328	TI2OE—478,836
G3FPQ—565,080	DJ1BZ—354,598
ON4SZ—529,200	VQ2VZ—312,728
OQ5LL—275,136	

TOP FIVE
All Band Multi-Operator
HZ1AZ—476,190

CN8AR—417,358	DL6NK—286,405
DJ3VM—325,105	GB2SM—282,266

BAND LEADERS

28 mc —	CX1AK	— 124,937
21 mc —	**CE3DY**	**— 200,508**
14 mc —	CO2ZS	— 116,464
3.5 mc —	G5MP	— 1,357

It was only a question of time before the 4X4 gang once again took over top honors in the phone competition. Yair Ben Nissim, 4X4GB who has been a consistent preformer and improving his score each year, finally came up with an all out effort. His 829,864 points is by far the highest score ever submitted by a Single Operator in a World Wide Phone Contest. His activity was distributed on 10, 15 and 20 and those European three pointers sure gave his score a big boost. So dust off a spot in your shack Yair, the Bill Leonard, W2SKE Trophy will be coming your way in the near future.

In second position is VQ4DT with a score that also exceeded all previous All Band winners. His 28 *mc* score exceed that of any single band operator on 10 but he was short of points on 14 *mc*. However it was indeed a very fine performance.

CN8JF took over the show position with the highest number of QSOs but Jack didn't have the multiplier to back it up for a winning score.

Most of the other Top Ten spots were dominated by European and African stations. TI2OE and CX2CO upheld honors for the Western Hemisphere. W1ONK made the best showing in the US but the W/Ks were out of the running.

Missing this year were CO2BL and OE5CK who in past years could always be found among the leaders.

The most active band by far was 28 *mc* and this year's Top Man on that band is CX1AK. Last year's 28 *mc* and Single Band winner, OH5NW, was second. Axel was knocked out of competition by a 7 hour loss to power. In third spot and the only other station to break 100,000 is G3JZK.

All that 28 *mc* activity from Japan was due to the fact that a new regulation permitted second class operators to use 10 phone.

In spite of a "hot" band, the US stations faired poorly but W2VCZ with 43,775 points made the best showing.

Single Band honors and winner of the Don Wallace, W6AM Trophy is Oscar Acosta, CE3DY on 21 *mc*. With a magnificent score of 200,508 points and a total of 97 countries in his multiplier, Oscar was just about tops in all departments. Runner-up on 21 *mc* is another South American, HC1IE. In the third spot is a YL, KH6DLD, ex-KL7BHE. Sheila only received her new call a few days before contest time and found pickings much better in Hawaii.

Here again most of the high scorers were overseas stations. W3AOH who usually is found in the multi-operator column, went it alone on 21 *mc* and was the US leader with 63,147 points.

Activity on 14 *mc* was perhaps the lowest of the three DX bands. CO2ZS who was last year's leader on 21 *mc*, switched bands and his 116,464 points made him Top Man on 14 *mc* this year. Not far behind is that exponent on sideband, Humberto Perez of TI2 Horse Power fame. Humberto used SSB exclusively and ran up an imposing number of contacts on 14 *mc*. W2HTI with 39,270 points was the only US station with a fair score on this band. If you are wondering how come W1NLM with only 20 contacts rates a certificate, Everett was operating under perhaps the most difficult of all handicaps, he is blind.

What happened to 7 *mc*? It was completely ignored by all except a few of the multiplier seekers in the all band competition.

The activity on 80 was also at a low ebb. Last year's winner on this band was one of the few exceptions. G5MP improved his last year's score and once again is the leader on that band.

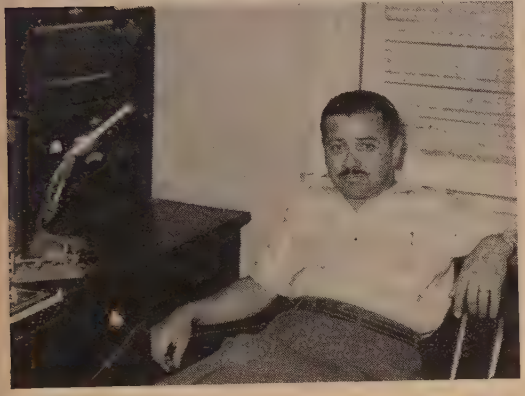
The multi-operator scoring was not up to its potential level. Most of the single operator leaders had much higher scores and the single transmitter classification made a much better showing than the multi-transmitter groups.

A group of seven men at HZ1AB, representing the Dhahran Airfield Amateur Radio Club, got the most out of a BC610, a rhombic





Yair Ben Nissim, 4X4GB, and the modest layout that won him world honors on All Band and the W2SKE Trophy. The impressive beam array that gave his 250 watts a real sock.



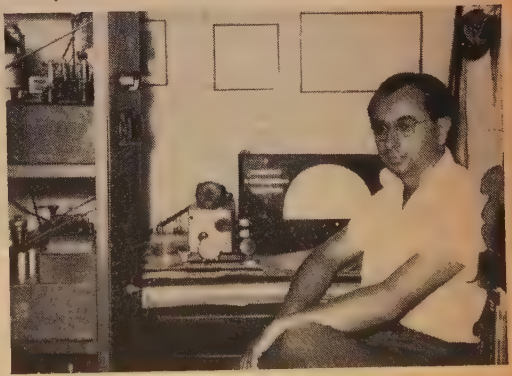
Oscar Acosta, CE3DY, won the W6AM Trophy with his high Phone Score on a single band. His 4 element beam on 15 gives his 100 watts a boost.



Javier E. del Llano, TI20E, and his family. How he ever managed to make Top Ten with all that QRM is a real mystery.



The multi-operator group at SM5AZU. L to r, Bert, Kiell and Bo. Man, it's cold inside.



Julian Scarlatescu, YO3VI, winner and only entry from Roumania.



Nelson C. Rocket, PY3AFO, 28 mc winner for Brazil.



G. T. Sassoon, G3JZG, 28 mc winner for England.

and a fixed 20 meter beam to win the Don Merten, K2AAA Trophy with a score of 476,190 points. A four man team in Morocco with only 100 watts from a 32V-2 to cubical quads put CN8AR in the runner-up spot. Two of the boys at K6EVR made high score for the W/Ks.

The anticipated high scores from the multi-transmitter powerhouses did not materialize. Past performers K2GL, W3AOH and W6YMD failed to make an appearance, so there was no need for the additional classification this year. Over in Germany a group of GIs packed a 5 *kw* generator, a 14 man tent and stacks of low powered radio gear in a truck and set-up DL4OL/P in the shadow of "Frankenstein" Castle. Being limited to dipole antennas their score suffered but they sure had a ball.

Prominent YLs in this year's contest were JA1YL, 4S7YL, KH6DLD and K6QPG/KW6, all of them certificate winners.

All in all it was a good contest. We received 569 logs and 254 certificates will be mailed to winners in 97 different countries, a substantial increase over last year, much to our surprise.

However on the strength of the known activity we feel that even this could have been improved. We were particularly pleased with the number of SSB stations that participated this year. Don't pass it up in the next phone contest.

Results of the CW week end will appear in next month's issue, so back to the salt mines.



Axel Tigerstedt, OH5NW receiving the W6AM Trophy from V. Karkila, OH2ZH (left) President of the Finnish Radio Amateur League. Axel had the top score on a Single Band, 28 mc phone in 1958.

1959 DX Contest Results

Number groups after call letters denote the following: Band, final score, number of QSOs, zones, and countries. Letters designate power used, A—Up to 35 watts. B—Up to 150 watts. C—Up to 500 watts. D—500 watts and over Winners are in **bold face** type.

Single Operator

NORTH AMERICA

United States

W1ONK	A	**212,816**	**388**	**61**	**127**	**D**
W1FDF	A	173,826	356	58	116	D
W1FZ	A	23,000	94	33	59	D
W1YQF	A	13,950	87	19	43	B
W1OKG	A	7,320	48	25	36	D
W1PLJ	A	525	11	10	11	—
W1WLG						
	28	**37,944**	**189**	**21**	**51**	**B**
W1JNZ	28	23,436	129	19	14	C
W1CKA						
	28	20,020	103	23	47	B
W1WY	28	4,212	42	16	23	B
W1RWU						
	28	1,653	29	3	16	C
K1DCB	28	507	13	4	9	—
W1IUU	21	**4,773**	**45**	**15**	**28**	**B**
W1REP						
	21	189	9	1	6	—
W1NLM						
	14	**1,363**	**20**	**12**	**17**	**B**
W1ICV	14	1,064	18	11	17	D
W1ZBT						
	3.5	232	33	4	4	—
K2IEG	A	**98,600**	**223**	**53**	**117**	**D**
K2BZT	A	**59,940**	**197**	**31**	**77**	**C**
W2MA	A	25,833	97	43	66	B
K2DCA	A	15,222	75	33	53	D
W2SNI	A	13,536	70	24	48	C
W2OKJ	A	13,338	74	32	46	—
W2CGJ	A	12,210	69	27	47	C
W2UTH	A	7,326	53	29	37	C
W2VCZ	28	**43,775**	**156**	**30**	**73**	**D**
W2BOK						
	28	10,192	71	19	33	B
W2KHR						
	28	5,460	50	15	27	B
K2RBD	28	777	15	9	12	B
W2NNB						
	28	528	11	6	10	B
W2WZ	21	**48,780**	**212**	**26**	**64**	**D**
W2VRE						
	21	26,950	130	22	55	C
W2HTI	14	**39,270**	**143**	**31**	**74**	**D**
W2JVU						
	14	23,460	104	30	55	D
W2SUC						
	14	18,088	108	26	50	D
W3RPG	A	**35,616**	**124**	**42**	**64**	**D**
W3OCU	A	15,300	82	28	47	C
W3ROA	A	5,500	44	20	31	B
W3LEZ	A	2,464	37	10	18	B
W3AYD						
	28	**23,790**	**112**	**25**	**53**	**C**
W3ZEQ						
	28	23,450	122	22	48	C
W3AOH						
	21	**63,147**	**236**	**26**	**71**	**D**
W3SOH						
	21	49	4	3	4	B
W3CJI	14	**4,264**	**40**	**19**	**33**	**D**
K4QIJ	A	**62,400**	**185**	**47**	**83**	**D**
W4NWT						
	A	7,125	43	23	34	B
W4EEO	A	720	12	9	11	B
W4PNK						
	A	210	7	4	6	C
K4JQR	28	6,847	62	16	25	B
K4WDS						
	28	2,240	30	13	19	B
W4NQM						
	21	**36,960**	**165**	**24**	**60**	**D**
W4DRW						
	21	22,831	114	25	54	D
K4GIB	21	21,329	105	23	54	C
K4SJU	21	14,003	82	22	45	B
K4ILW	21	11,310	80	21	37	B
W4DS	14	575	17	8	15	—
W4KAC						
	3.5	40	8	4	4	D
K5MDX	A	**100,394**	**209**	**67**	**135**	**C**
W5INL	A	50,544	143	53	91	D
K5LZO	A	13,795	70	40	10	D
W5ZGP	A	2,240	28	18	22	C
W5SU	A	660	11	11	11	C
W5ALB	28	**22,119**	**114**	**22**	**51**	**C**
W5DQK						
	28	17,860	92	25	51	B
W5SFW						
	28	16,947	102	23	40	C
K5GOE	28	11,781	71	24	39	B
K5IIN	28	6,250	60	20	30	B
W5LGG						
	28	5,311	45	19	28	B
K5WNK						
	28	1,161	19	13	14	C
K5JEH	21	**3,216**	**36**	**19**	**29**	**B**
W5KC	14	**12,408**	**86**	**21**	**38**	**D**
W5CYE	14	5,643	45	23	34	D
W6VSS	A	**182,105**	**329**	**86**	**129**	**D**
W6SXI	A	13,321	73	36	41	D
K6IPV	A	1,428	19	16	18	B
W6PIF	A	440	10	10	10	B
W6PQW						
	28	**24,072**	**126**	**25**	**43**	**B**
K6CT	28	9,384	74	19	27	B
K6GQH						
	28	5,070	57	17	22	D
K6TFC	28	3,074	43	13	16	B
W6OJW						
	28	540	15	6	6	B
W6UFJ	28	24	3	2	2	A
W6SIA	21	**9,075**	**66**	**22**	**33**	**C**
K6LGF	14	**18,130**	**104**	**27**	**47**	**D**
WA6EYP						
	14	11,175	61	29	46	D
K6OCX	14	1,035	23	11	12	C
K6UFX	14	504	16	10	8	D
W6BJA						
	14	336	10	4	8	C
W7UPF	A	**15,481**	**71**	**34**	**55**	**D**
W7DLR	A	1,728	25	17	19	B
W7VIU	A	440	13	11	11	D
W7VY	28	**13,250**	**96**	**19**	**31**	**D**
W7KOI	21	651	11	11	31	B
W8JIN	A	**141,980**	**252**	**79**	**150**	**D**
W8NWO						
	A	**114,576**	**218**	**84**	**133**	**D**
W8NXF	A	**106,729**	**217**	**68**	**125**	**C**
W8WT	A	39,304	122	49	87	B
W8HUD	A	32,010	110	41	69	D
W8BMX						
	A	12,040	65	30	47	B
W8BKO	A	5,856	43	25	36	D
W8IBX	A	5,406	41	20	31	C
W8UZC	A	5,100	38	20	30	B
W8SS	A	4,320	40	20	28	B
W8KC	A	2,320	29	10	19	C

'8BMX					
A	1,040	21	11	15	C
8UMR					
28	15,680	98	16	41	B
'8QHW					
28	7,300	55	19	31	B
8AAG 28	7,093	66	16	25	C
8HTM					
28	1,188	21	8	14	B
'8UPN					
21	55,387	208	30	67	D
'8RTF 21	4,888	44	19	28	B
'8TTN 21	3,268	36	17	21	B
8CFU 14	609	15	9	12	D
'9EWC A	133,352	279	79	132	D
'9NZM					
A	101,039	217	70	121	D
'9WNV					
A	43,952	145	52	82	B
'9YYG A	1,452	23	7	15	—
'9ZTD 28	29,068	136	29	57	D
'9CUY 28	20,400	102	25	50	B
'9TKW					
28	12,871	77	21	40	C
'9OKH					
28	12,483	83	20	37	B
'9KRL 28	3,772	35	15	26	B
'9AVO 28	2,325	27	13	18	B
'9PPX 28	2,016	26	13	15	C
'9OZM					
28	1,860	23	13	18	B
9ECE 21	6,993	52	21	42	B
'9IUI 14	6,156	52	22	32	D
'9LRH 14	5,047	35	18	31	D
'9WKU					
14	1,860	26	11	20	D
ØBIT A	59,302	164	58	91	D
ØRNZ A	22,000	97	55	55	B
VØMCX					
A	10,962	63	39	48	C
VØVAF A	7,316	48	26	36	B
VØVXO					
28	28,187	154	26	45	B
VØBPO/M3					
28	210	13	7	7	A
XØHJS 14	2,244	46	23	28	C

Canada

VE1WG A	52,510	204	25	64	B
VE1EK A	1,711	27	12	17	B
VE2YU A	49,730	141	48	87	C
VE2BK A	13,246	66	28	46	C
VE2WY					
28	12,098	89	11	35	—
VE2MJ 28	7,511	73	9	28	B
VE2AYY					
14	13,908	90	22	39	B
VE2BAT					
14	1,456	33	9	17	B
VE3BMB					
A	38,236	138	43	78	B
VE3DYB					
A	35,742	130	39	72	B
VE3EOG					
A	26,524	118	23	53	B
VE3PY A	24,888	120	37	65	B
VE3ES A	20,503	99	42	59	B
VE3AEJ					
A	1,449	21	8	15	C
VE3AHU					
28	23,256	122	19	53	C
VE3BSJ					
14	4,512	49	15	32	B
VE4DF A	4,845	66	26	25	B
VE5VZ A	12,684	65	34	50	C
VE6IN 21	5,537	47	20	29	B
VE6BY 14	7,200	46	23	37	C
VE7ZM A	63,300	177	55	95	B
VE7FO A	25,728	120	44	52	B
VE7AHG					
14	20,580	104	29	55	D
VE8NH A	17,952	188	27	41	D
VE8TG A	9,072	124	26	30	D
VE8DW					
14	304	9	9	7	D
VOICZ A	10,465	65	25	40	—
W4ZGD/VOI					
28	39,493	229	22	61	B
KIJTB/VOI					
14	15,300	174	21	39	D

Alaska

KL7CDI A	16,704	207	26	32	C
KL7FAK					
14	35,724	169	26	52	D
KL7CDF					
14	24,480	270	17	34	D

Bahamas

VP7BB A	15,370	190	28	30	B
VP7BF A	2,208	57	15	17	B

Bermuda

VP9AK A	34,236	181	42	66	B
VP9BO A	3,240	63	19	26	B

Canal Zone

KZ5LC A	87,780	416	47	85	B
KZ5GW 21	19,467	199	18	45	B

Costa Rica

TI2OE A	478,836	885	81	201	B
TI2CMF					
28	16,646	150	17	41	B
TI2CAH					
21	9,690	109	19	32	B
TI2HP 14	91,840	514	33	79	D

Cuba

CO8JK 28	3,944	50	11	23	C
CO2OZ 21	70,985	349	28	73	B
CO2ZS 14	116,464	576	33	83	C

Dominican Republic

HI8SKE A	22,248	390	22	32	B

Greenland

OX3KW A	17,442	160	17	40	—
KG1AQ 14	16,014	251	20	31	C

Guantanamo Bay

KG4AM A	48,600	522	36	45	D

Haiti

HH2Z A	71,811	385	31	70	—

Mexico

XE1CP A	47,244	213	49	78	C
XE1SN A	30,772	150	42	56	C
XE1AE 14	26,061	219	25	48	D
XE1OT					
14	722	33	9	10	B/C

Nicaragua

YN1CK A	20,856	202	24	42	C

Panama

HP1AC A	15,246	180	23	40	A

St. Lucia

VP2SL 21	532	26	7	—	

AFRICA

Angola

CR6DB A	10,812	79	19	34	—
CR8CJ A	5,311	49	20	27	B
CR6BX 28	84,448	288	28	76	C

Belgian Congo

OQ5LL A	275,136	504	57	135	—
OQ5JW 28	93,780	367	29	61	B
OQ5FV 28	21,672	124	23	49	B
OQ5IG 28	16,317	94	22	41	B
OQ5GL 21	14,016	85	22	42	A

Canary Is.

EA8BC A	47,554	152	40	78	A

French Eq. Africa

FQ8AF A	43,225	189	33	58	B

Kenya

VQ4DT A	640,252	837	80	188	B

Kerguelen Is.

FB8XX A	3,277	113	10	19	—

Liberia

EL4A A	145,576	439	44	80	—

Libya

5A2TC A	41,514	191	19	55	B

Madagascar

FB8CM A	13,575	78	27	48	—

Morocco

CN8JF A	566,328	1133	56	112	B
CN8JX 28	76,146	350	24	50	B
CN8CS 21	29,949	151	20	47	B

New Amsterdam Is.

FB8ZZ A	714	14	8	13	—

Rhodesia, No.

VQ2VZ A	312,728	557	64	130	B
VQ2WR					
28	35,625	166	23	52	B

Rhodesia, So.

ZE7JV 28	85,100	293	30	70	B
ZE4JG 28	7,480	58	14	30	B

Ruanda-Urundi

OQ0PD A	57,245	191	33	74	A

Tanganyika

VQ3GL 28	11,183	92	18	35	A

Union of South Africa

ZS5JY A	265,264	756	49	69	C
ZS6AWK					
28	31,832	240	15	31	B
ZS6MP 21	27,950	124	28	58	—

ASIA

Aden

VS9AH A	34,902	297	24	55	B

Bahrain

MP4BBW					
14	31,598	152	24	50	B

Ceylon

4S7YL A	39,160	140	45	65	B

Georgia, USSR

UF6FB 14	1,180	22	7	13	C

India

VU2NR 28	29,304	150	20	52	B
VU2RM 21	15,680	94	22	42	B

Israel

4X4GB A	829,864	977	84	209	C
4X4AU A	75,988	216	35	86	—
4X4JA A	28,835	132	19	60	B

Japan

JA1BQR					
A	13,950	77	35	40	A
JA1BF A	11,264	68	31	33	A
JA5AF A	3,375	32	21	24	A
JA2XW 28	54,760	260	28	46	B
JA1YL 28	31,000	201	24	38	C
JA1BWA					
28	14,400	92	21	29	A
JA1BDF					
28	12,926	97	21	25	B
JA1BUN					
28	10,868	92	20	24	A
JA6GT 28	8,811	91	13	20	B
JA3FV 28	8,229	71	16	23	B
JA1BRM					
28	7,520	68	19	21	A
JA1BLC					
28	6,400	60	17	23	B
JA1BRL					
28	5,181	58	16	17	B
JA7AD 28	4,865	47	15	20	B
JA3BY 28	3,565	41	15	16	A
JA1BIN 28	2,838	36	14	19	A
JA3IW 28	2,354	40	10	12	A
JA2UJ 28	1,064	20	8	11	A
JA1BK 28	374	14	7	10	B
JA1BLV					
28	210	7	7	7	B
JA1WC 28	80	4	4	4	A
JA1AYO					
28	18	3	3	3	A
JA6BC 21	36,750	187	25	45	B
JA3IS 21	35,550	169	29	46	B
JA3JM 21	6,972	65	19	23	A
JA7IJ 7	36	3	3	3	A
KA2RJ A	21,148	114	30	38	B
KA2BW A	17,385	97	31	30	D
KA2LL A	9,150	52	29	32	B
KA2AA 28	53,056	286	28	36	B
KA2DE 21	17,160	151	17	22	B

Korea

HL9KJ A	4,752	49	23	31	—

Macau

CR9AH 14	8,294	99	14	15	D

Ryukyu Is.

KR6JR A	67,281	217	58	65	D
KR6GE A	26,640	119	40	50	D
KR6RB 21	85,176	264	36	81	B
KR6HS 21	46,575	208	29	52	B
KR6CR 21	22,119	120	25	48	—

Taiwan

BV1USE					
14	24,461	152	25	36	D

Thailand

HS1B A	52,479	195	48	71	B

EUROPE

Aland Is.

OH0NC A	104,715	323	54	125	B

Austria

OE1DH A	55,372	218	40	87	B

Belgium

ON4SZ A	529,200	676	90	210	B
ON4GM A	81,995	242	51	64	B
ON4DG A	52,538	190	39	70	B
ON4BX A	12,960	61	28	53	B

Bulgaria

LZ2KKZ					
21	510	28	4	13	A

Czechoslovakia

OK1KDC					
A	2,310	42	14	28	—
OK3KGI					
21	9,765	145	15	30	A
OK1KIR					
21	4,730	57	14	29	B
OK3KRN					
21	2,604	54	9	22	A
OK1KKJ					
14	24,825	250	20	55	B
OK1FT 14	2,312	42	12	22	A

Denmark

OZ5JT A	96,600	251	61	100	B
OZ3WK A	31,291	143	35	48	B
OZ5KQ 14	30,222	174	25	48	B

Eire

EI9V A	46,863	243	36	91	B

England

G3FPQ A	565,080	743	88	189	B
G2DYV A	155,172	329	65	136	B
G3DKR A	53,391	194	37	74	B
G3LCH A	30,815	215	22	45	A
G2AJB A	13,104	88	26	52	B
G3MWZ A	1,749	41	11	22	A
G3JZK 28	100,014	430	29	50	B
G3DO 28	88,494	320	30	68	B
G5MP 3.5	1,357	59	3	20	B

Finland

OH5NQ A	197,730	465	64	174	B
OH2EW A	28,665	148	24	67	B
OH5RZ A	23,384	203	23	56	B
OH3NY A	10,800	77	26	54	A
OH2FT A	2,021	40	11	29	B
OH6OM A	784	26	8	20	B
OH2QD A	648	18	9	15	B
OH5NW					
28	118,080	369	33	87	B
OH5PN 28	7,748	72	16	36	B
OH5QN 21	66,768	315	31	73	B
OH5QX 21	99	10	2	9	—
OH3TH 14	14,074	113	20	42	B
OH2RZ 14	7,638	79	18	39	B
OH4LJ 14	4,950	67	15	35	B
OH5OA 14	2,688	60	9	23	B

Faeroes Is.

OY7ML 14	5,922	82	16	31	B

France

F2DZ A	161,160	362	56	102	B
F8WE A	56,994	271	42	96	—
F9SH A	45,087	149	45	88	B
F3GL A	23,256	82	24	44	—
F8TM A	837	28	9	22	B
F8PI 28	61,486	282	26	50	B
F9WK 28	2,136	63	6	6	A
F8XP 21	16,046	111	16	55	B
F7BK A	10,585	91	23	50	B
F7GT A	2,205	35	10	11	—
F7GR 28	1,344	38	6	6	A

Germany

DJ1BZ A	354,598	646	64	150	C
DJ1NY A	128,232	319	57	99	C
DL3YO A	101,270	239	65	125	B
DL7AD A	90,620	212	64	133	B
DL9OH A	60,888	230	49	128	B
DL7GQ A	42,826	172	39	94	—
DL7CE A	33,368	139	26	60	B
DM3JD A	5,382	62	18	28	A
DL1YA A	792	16	10	14	—
DJ1LP 28	64,394	259	27	62	B
DL1LH 28	36,252	172	24	52	B
DL7HU 28	8,064	63	16	32	B
DL9PV 28	7,560	54	18	36	B
DJ2IV 28	7,540	59	18	34	A
DL3TJ 21	45,125	197	29	66	B
DL1JW 21	23,046	130	25	44	B
DJ2BW 14	40,475	194	26	63	C
DJ1XC 14	6,660	119	12	33	B
DJ2AE 14	528	33	3	13	—
DJ2IR 14	90	6	3	6	C
DL4GX A	63,754	216	42	62	B
DL4NZ A	14,008	130	23	45	B
DL4NF A	4,187	40	22	31	B
DL2YU 28	21,634	134	22	36	B

Hungary

HA9OZ A	3,510	44	16	23	A
HA5DG A	2,046	41	8	25	A

Italy

I1ZFT A	258,940	464	66	154	B
I1ZIE A	42,614	190	38	105	B
I1NE A	7,182	50	21	42	B
I1AB A	2,139	32	12	19	B
I1CHJ 28	47,088	226	24	48	B
I1AHW 28	30,024	151	23	49	B
I1TDX 28	29,925	154	22	41	—
I1ZZ 28	25,470	102	18	27	B
I1ARC 28	11,778	116	14	25	A
I1SGZ 28	4,181	48	11	26	A
I1ZYM 21	10,098	89	14	37	—
I1AMU 14	40,406	233	27	62	—
I1ZLW 14	11,648	169	16	40	B

Jan Mayen

LA8SG/F					
A	512	16	8	8	A

Netherlands

PAØDVM					
A	27,729	172	30	87	B
PAØUC A	17,766	96	32	62	A
PAØFB A	16,060	148	20	35	B
PAØVB A	10,640	74	29	47	B
PAØHSJ					
A	9,576	84	23	49	—
PAØDJ A	3,237	63	11	28	B
PAØXZZ					
A	294	7	7	7	—
PAØHBO					
28	57,288	235	27	57	B
PAØOTC					
28	5,406	38	17	24	B
PAØKSB					
28	3,120	53	9	11	B
PAØEEM					
21	50,668	191	34	72	B

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New Product Detector Tube

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Box 137
Ontario, California

A new product detector tube for use in the circuit developed by ZL 1AAX. The new tube, made by RCA, simplifies the circuit and improves the performance.

Some time ago, Lester Earnshaw, ZL1AAX, described a new product detector configuration that provides the ultimate in SSB generation and demodulation with a minimum of intermodulation distortion. Independently, Radio Corporation of America has just introduced a beam switching tube designed expressly for use in the circuits described by ZL1AAX (A New Product Detector, Aug. 1959 CQ, p. 36).

The new tube, designated RCA-7360, allows simplified, low-cost circuitry, with greatly improved performance in suppressed-carrier communications equipment, in both the receiving and generating sections. The tube is capable of operation to at least 100 *mc*.

Although not particularly of interest to amateurs, the tube should have wide acceptance in the sound field. The unique deflection system makes it well suited for use in low-distortion audio-fader circuits, remote switching of studio and high-fidelity equipment.

Application Data

The chart, fig. 1, describes the more important characteristics of the 7360 beam deflection tube. The total beam current is controlled by the bias on grid #1, similar to a conventional tetrode. When the deflection electrodes are properly balanced, the gain between grid #1 and each plate will be equal. For any given set of voltages, the total beam current (the sum of the two plate currents) will remain constant. The division of the beam current between the two plates is controlled by the potential difference between the deflectors. Since the total beam current remains constant, a signal applied to one of the deflection electrodes will produce a signal 180° out of phase in the corresponding plate circuit and a simultaneous in-phase signal in the other plate circuit.

An electron beam tube of this nature is affected by the presence of magnetic fields, and is therefore extremely susceptible to the effect of stray magnetic fields. The 7360 is internally

RCA-7360	
Electrical Data	
Filament voltage	6.3 volts
Filament current	0.35 amp.
Input capacity (grid electrode to all others)	7.5 mmfd.
Output capacity (anode to all other electrodes)	0.9 mmfd.
Deflector capacitor (to all other electrodes)	5.6 mmfd.
Plate to plate capacity	0.3 mmfd.
Grid #1 to either plate	0.003 mmfd.
Mechanical Data	
Mounting position	any
Length (including pins)	2⅝"
Diameter	⅞"
Base	Noval 9-pin
Pin connections	see below
Average Characteristics	
Plate voltage	150 volts
Grid #2 voltage	125 volts
Deflection electrode voltage	25 volts
Cathode resistor	270 ohms
Beam current	5 ma.
Grid #2 current	1.2 ma.
Grid #1 Gm	5000 umhos
Deflector Gm	800 umhos
Deflector switching voltage	8.5 volts
Maximum Ratings (Absolute values)	
Plate voltage	300 volts
Grid #2 voltage	250 volts
Deflector voltage	±100 volts
Plate dissipation (each plate)	1.5 watts
Grid #2 dissipation	0.5 watts
Typical Conditions—Balanced modulator	
Plate voltage	250 volts
Grid #2 voltage	250 volts
Deflector voltage (DC)	25 volts
P-p carrier voltage	10 volts
Deflector voltage (RMS)	1.0 volts

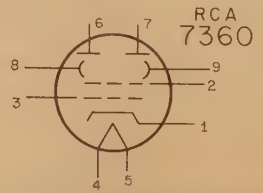


Fig. 1—Data and basing for the RCA 7360.

shielded to minimize this effect. It is recommended that an external shield be used and that it be located away from filter chokes, power transformers, motors, and other sources of strong magnetic fields.

The 7360 is usually operated from a 150 volt supply, although this is not critical. The plate voltage must be sufficiently high to prevent the minimum instantaneous plate voltage from swinging in the vicinity of the knee voltage (about 50 volts). As with any pentode or tetrode, this results in high screen current and excessive distortion.

The deflectors operate at a positive potential in the range of 20 to 35 volts with respect to the cathode, and draw 30 to 50 microamperes. This current will vary non-linearly when *ac* is applied to the deflectors and therefore, the impedance of the circuit should be less than 50K. Naturally, the deflector signal should be equal in amplitude and opposite in phase.

Audio Circuits

The unique feature of providing an intrinsically balanced push-pull output from a single-ended input should not be overlooked. Figure 2 shows a radical push-pull audio amplifier. It could be used in amateur speech amplifiers, but is a natural for hi-fi equipment. This type of phase inverter overcomes all the disadvantages of the circuits currently being used (Miller effect, unequal output, phase shift, etc.). The balance control can set both outputs simultaneously, so that they are equal and opposite. In addition, grid number one can be used as an electronic volume control for fader applications.

Rf Circuits

Some amateurs may have difficulty using these beam deflecting tubes in balanced modulators and demodulators. When the balance potentiometer is set for minimum "un-wanted" output, and the null is not in excess of 50- 60-*db* it is possible that the two plate signals are in a condition of *phase unbalance*. Although not likely at audio frequencies, it can occur with *rf* due to unequal capacity between control grid and plate. The capacities inside the tube are very closely matched, but precautions must be observed with lead-dress to minimize and equalize the stray capacities. RF energy at the deflectors can also cause phase unbalance and they should be well by-passed at the carrier frequency. For ultimate balance in this circuit, you can connect a small differential capacitor with the stators connected to each end of the output coil and the rotor connected to the signal grid or ground.

The 7360 can be used with self excited carrier or heterodyne oscillators, as shown in fig. 3, for very compact equipment. Excessive distortion occurs when the control grid (#1) is allowed near the zero bias region. For this reason grid leak bias is not compatible with low distortion. The advantages of grid leak bias can be obtained, however, by using a diode clamp in the grid circuit. A cathode resistor can then be used to provide a small fixed minimum bias. The grid signal should be 5 to 10 volts peak-to-peak with respect to the cathode for either self-excitation or separate excitation. The value is not critical, but conversion gain should be optimized by adjusting the grid input signal level.

When used as a balanced modulator, carrier suppression readings of 60 *db* below the single sideband output are readily obtainable. The major third order distortion component is —47 *db* below the sideband output; the major fourth order component is —55 *db*. These are average readings and were obtained with a 10 volt peak-to-peak carrier signal and 1.0 volt *rms* audio signal.

The 7360 can also be employed in the classic phasing generator using two 12AT7's, to greatly improve performance. The *rf* carrier phase shift network can be a simple RC bridge. The audio phase shift network can be used to connect directly between the audio voltage amplifier and the deflectors without the use of a buffer stage, phase inverter, or push-pull stage. The screen grid provides effective isolation between the carrier and audio input eliminating interaction between the carrier and audio circuits. Current does not flow through the balance controls as it does in the cathode circuit of a 12AT7 balanced modulator. Thus, overall carrier suppression of 60 *db* below the sideband output can be readily obtained, and more important, it will remain constant over the normal range of ambient temperatures without special components. Un-

[*Continued on page 114*]

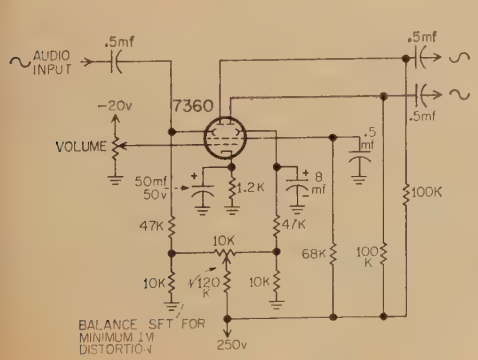


Fig. 2—A new audio electronic phase splitter.

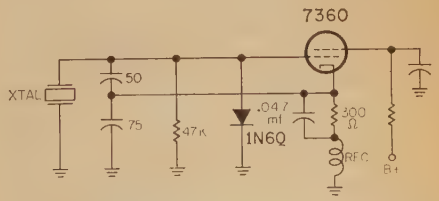
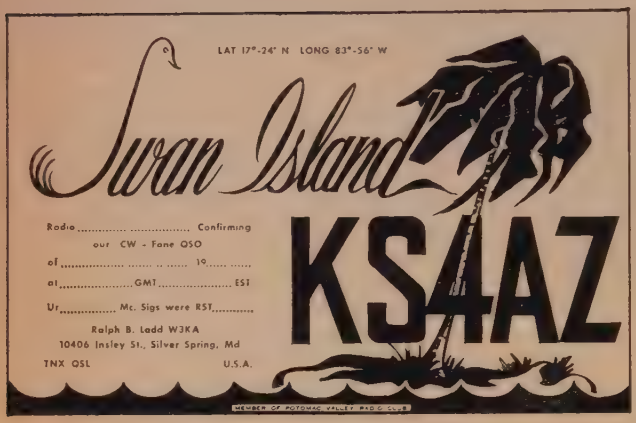


Fig. 3—Self excited carrier oscillator. The remainder of the tube circuitry is similar to ZL1AAX product detector.

Journey To Swan Island



Victor C. Clark, W4KFC
RFD 1
Clifton, Virginia

The February, 1960, DXpedition of Potomac Valley Radio Club members, W3KA, W4JNE and W4KFC to Swan Island, was aimed primarily at participation in the first week-end of the 1960 ARRL CW DX Tests.

Swan Island is located at Latitude 17° 24′ N., and Longitude 83° 56′ W., which is in the Caribbean Sea and about one hundred miles north of the coast of Honduras. Transportation schedules to the island are irregular and restricted to a few banana boats which sail from Tampa, Fla., to Central American ports, dropping off freight and mail for the Weather Bureau station on the island. The trip from Tampa takes from three to five days, depending upon the weather, and sailing dates are not predictable for more than a day or so in advance. For this reason our presence on the island during the weekend of the contest could not be forecast with certainty.

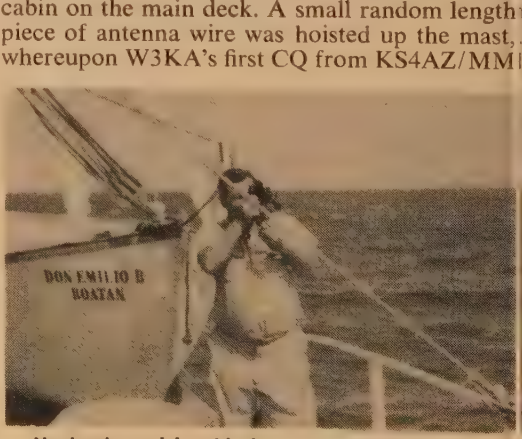
The Trip

Our arrangement with the shipping company to notify us "at least two days in advance of the sailing date" (so that we could arrange to be absent from our jobs) resulted in telegraphic notification that the boat would leave "tomorrow night." Thus expedited, departure preparations were hastily completed. Following a 1000-mile drive to Tampa—highlighted by a generator failure in W4JNE's car and a fitful snooze on the main street of Sumter, South Carolina, while we waited for the Chevy garage to open—we arrived less than an hour before the 11:00 p.m. sailing time for the "Don Emilio B."

The "Don", which is of Honduran registry and carries an all-Honduran crew, is a converted LCI. Those familiar with the LCI can understand in some measure the discomforts which might be involved in a crossing of the choppy Gulf of Mexico in this shallow-draft, keeless vessel.

Our second day out—the low point of the trip for about half of the crew, as well as for our three heroes—was marked with gale force winds which brought 25 foot combers quartering from the southwest. Had there been a convenient point to disembark, the DXpedition would have been unanimously terminated, then and there. The following day, however, brought calmer waters, sunny skies and a new note of enthusiasm on the part of all.

We obtained permission from the captain of the "Don" to operate our little RS-6 15-watt CW transmitter and succeeded in getting a line run from an *ac* generator in the hold up to our cabin on the main deck. A small random length piece of antenna wire was hoisted up the mast, whereupon W3KA's first CQ from KS4AZ/MM



Navigating solely with the aid of a sextant, Captain Johnny made a perfect landfall within five minutes of his prediction!

was answered by W4JJL in Norfolk, Virginia. From that point on, little difficulty was encountered in stirring up contacts with U.S. stations, and nearly 200 QSO's were logged during the trips to and from the island.

A few European contacts were also made, although DXing was sharply restricted by the high noise level from the generator, which limited reception to S7 or better signals. We found it hard to believe the several S8 and S9 reports which we received while using the diminutive rig (see picture) and makeshift antenna aboard ship. Our only 7 *mc* contact from the ship was with W4YE in Fairfax, Va.

"Captain Johnny" of the "Don Emilio" violated DXpedition tradition by (1) failing to drop the sextant and (2) hitting the island "on the nose" without any exhibition of uncertainty or missed approaches.

We were treated to our first view of Swan Island (more properly called Swan Islands, for there are two of them) on the early morning of February 15; the first indication of its proximity



Ralph, W3KA, holds the RS-6 transmitter used on the ship.

coming from the rotating beacon light on the island. As the two low-lying islands emerged above the horizon, we could see cocoanut palm trees and the antenna masts of the weather station and homing facility.

There are no port facilities at Swan Island; cargo and passengers make the trip from an anchorage point a few hundred yards offshore in a longboat of ancient vintage, paddled by a half dozen handsome smiling West Indians. We were instructed to climb aboard this craft after 32 heavy cylinders of helium gas had been loaded, depressing the longboat to within three inches of catastrophe. One cheerful native bailed with a tin can while the others rowed for shore.

We were introduced to the six Government personnel on the island (four Weather Bureau and two Federal Aviation Agency employees) and then given a tour of the station.

Setting Up

We were appalled to discover that the Eldico



The Swan Island "water taxi."

SB-MIL100 exciter and SB-MIL1000 one kilowatt amplifier we had planned to use during our stay on the island had failed to arrive. These had been shipped from New York about three weeks before our departure. This development reduced our transmitting equipment resources to a TCS transmitter (push-pull 1625's at 75 watts) which had been brought along for 160 meter operation, the little 15 watt RS-6 rig and a rusted and corroded Meissner Signal Shifter and RCA ET-4336A rig (parallel 813's) which had been used years ago by hams stationed on the island. The latter gear was in an advanced state of disrepair, but after a couple of days work, rewarded us with a sickly burst of *rf*. Failures were frequent, however, and considerable improvisation was necessary to keep it on the air. The three element beam erected by an earlier KS4, and used by Ralph (W3KA) during his 1958 DXpedition, presented a discouraging appearance; one element was found lying pretzel-fashion in the grass and the others hung at rakish angles. Hasty repairs restored much of its original effectiveness, if not its beauty.

The lack of time, compelling desire to work as many stations as possible with our limited transmitting capabilities and the distance to the nearest radio store, precluded further improving of the station equipment; we entered the contest, therefore, with the Meissner/RCA combination —now issuing between four and five hundred watts of *rf* into the snaggle-toothed beam—on twenty meters, the TCS carrying the 40, 80 and 160 meter load, and a hastily-constructed 807 tripler (driven by the little RS-6 rig) with barely discernible output on 15 meters.

The TCS and 20 meter rig were arranged to provide for independent operation, so that their simultaneous use would be possible during periods when the lower-frequency bands were open. The key click problem with this equipment was, as might be expected, severe. We had neither the time nor facilities for improving the situation, so we endured it as best we could, although it handicapped reception and often made repeats necessary. We frequently had to call for a momentary pause in transmissions from one position in order to siphon a weak



Dick, W4JNE, at the twenty meter position.

one out of the noise at the other.

Non-availability of the Eldico rig effectively scotched our plans to work voice (both AM and SSB) although somewhat more than 200 SSB contacts were made using a borrowed Collins-32RS1 transceiver; this unit is employed on an official point-to-point circuit and our access to it, of course, was limited. We know that the lack of voice work was disappointing to the AM and SB contingent, and we were also saddened by our inability to work ten meters and to provide a respectable signal on fifteen meters, for both bands would have netted several hundreds of contacts during the tests and the possibility of many more DX QSO's.

On the other side of the ledger, however, we were pleased with the results on the lower frequency bands, considering the handicaps. The big rig on twenty held together for nearly 2,000 QSO's during the 48-hour period of the tests alone, while the little TCS added several hundred forty and eighty meter contacts.

160 Meters

The Caribbean area has for some time been off limits for 160 meter operation for U.S. territory amateurs, because of the use of Loran for navigation in this zone. Loran signals are not audible below about 1825 *kc*, however, and on the long chance that the request might be favorably regarded, we applied a few days before our departure date to the Federal Communications Commission for permission to operate KS4AZ in the 1800-1805 *kc* segment of the band on the two DX Test nights. Our request specified that operation would be with an input power of fifty watts and only on a non-interference basis to Loran transmission. A method for contacting us during the period of proposed operation was outlined, should this prove to be necessary. We were rewarded with a prompt reply from FCC extending permission for us to operate under the terms of our request.

Two hours of activity on the 160 meter band netted forty five contacts with five countries, all U.S. call areas except the seventh, and VE1 and 3. HC4IE was our first 160 meter contact, while old reliable W1BB was the first U.S. station worked. Outstanding signals on "Top Band" were those of W1BB, W6KIP, W8JIN and WØGBV, with many others close behind. The rattle of the Loran stations obscured any signals which might otherwise have been audible in the "DX" portion of the band.

We wish to express our appreciation to the FCC and the U.S. Coast Guard for their action in authorizing operation on this band, as well as to W1BB and W4PVA for the prompt loan of 160 meter crystals used.

40 and 80 Meters

Eighty meters yielded some surprising DX, generally poor conditions notwithstanding. Numerous European and New Zealand hams were worked on this band with the little TCS. A number of Europeans and South Americans were worked on forty, but propagation conditions to the Pacific were very poor from KS4 during this period. A few weak JA's and VK's were called on forty without success in the early morning hours. Surprisingly enough, we received a message from VU2JA stating that he had heard us on forty meters, but the ever-present and potent U.S. signals rarely permitted plumbing of the lower levels for real DX on this band.

Our final tally shows 2,542 QSO's made during the ARRL DX Test weekend, and a total of 4,590 QSO's with all 50 states and 64 countries during our eight day stay on the island.

We should note that our first contact from the island was with the TCS on 40, when W4FWF answered our initial CQ on that band. The first overseas contact was with G3FPQ only a few minutes later. It would be difficult to select any U.S. signals as outstanding, for there were hundreds that were of steamboat whistle proportions. Somehow, though, the trumpeting of W4CXA and W8FGX seemed to be a bit more authoritative whenever they joined the pile-up.

Operating Procedure

To say that we enjoyed occupying the role of the pursued would be an understatement. It was an exciting and thrill-packed experience for each of us and, as earlier DXpeditioners have noted, observation of operating procedures from the vantage point of a DX station provides new perspectives. We quickly confirmed that the short, snappy call towers head and shoulders above any other method intended to attract the attention of the alert DX op; conversely, the long-called W can become very tiresome indeed. Those who pleaded "KS4AZ, KS4AZ, KS4AZ," ad infinitum, frequently reminded us of KH6IJ's sage advice: "Fellows, don't send my call . . . I know my call . . . what I want to know is *your* call!" (and Katashi might have added "Just send it *once!*")

We favored on-frequency operation as best, at least in our particular situation. Once a call-

and-listen rhythm had been established, very little trouble was experienced with W QRM to our transmissions. Working stations on our own frequency enabled us to observe any potential interference to our own signals and must have reduced the QRM to other activities on the band. This brief experience on the other side of the fence leads us to question whether the "5-up, 10-down, QLM" school of thought shouldn't be re-examined. Admittedly, these expedients can be of benefit in situations where an unmanageable pile-up of calling stations exists, or, possibly where the elusive one is very weak or otherwise handicapped. In many cases, however, the establishment of a separate calling frequency (which usually develops into a sizeable band of frequencies) seems to succeed primarily in cluttering up the spectrum, frustrating the pursuers and generating a group of anonymous policemen to direct the "lids."

Reception of W/VE stations at Swan Island during our eight days there was probably as good as or better than it would have been from any point in the U.S. The W/K/VE gang boomed through at all hours and their number was seemingly endless. It quickly became apparent to us why a Caribbean or Central American amateur might display limited enthusiasm for working W's; they are so loud and numerous that they quickly become commonplace to the point of boredom.

Any attempt to work DX through the wall of Norte Americanos is, for the Latin American ham, fraught with difficulties. A "CQ DX" is sure to result in a horde of calling W's, to whom this station represents a choice bit of DX. If he specifies "Europe only", for example, many of the W's will probably respect the instruction, but a minority may continue to call either because they failed to get the message, because they "need" him desperately (and are sure the feeling is reciprocal), or because they are of the same ilk as the fellow who told us "I don't pay any attention to directional CQ's." On casual inspection, such a persistently calling minority may sound very much like the original group, augmented (as it will be) by late arrivals who call speculatively. The impression can thus be created that the W's just do not cooperate at all.

Neglecting this small residual of persistent callers, however, we found the W's to be very cooperative and well disciplined. The degree of cooperation appeared to vary in direct proportion to the clarity of our request and the frequency with which it was repeated. It was really refreshing to perceive the silence that followed when the mountain of calling W's was asked to stand by for a few minutes while we sifted out a DX station.

When we asked for short calls, the majority gave us short calls. When we requested "No USA"—98% of the W's ceased calling. Occasional assurance that we would resume working the W/VE gang after a short period of DXing had an obvious salutary effect and probably dissuaded a number of eager beaver callers who might otherwise have attempted to "sneak" a QSO (the author is not altogether unsympathetic with this species!).

Conclusions

In retrospect, our experience seemed to allow these conclusions:

1. W's should call short, in rhythm with the call-and-reply rate established by the DX station being pursued. The short call gets the sharp DX op.
2. DX operators should issue clear and frequent instructions outlining their preferences; i.e. "No USA," "Europe only," and so forth, *but should intersperse their DX-ing activities with at least occasional QSO opportunities for W's,* if their wishes are to be respected.
3. The DX op who extensively blacklists calling stations or signs off in a fit of pique because of presumed "ungentlemanly behavior" is simply attesting to his inability to control the situation due to his lack of operating prowess.
4. W's are a dime a dozen, particularly at close range, and can simply inundate a nearby DX station. We should respond to this situation by respecting the instructions outlined in directional CQ's. When the DX operator is good enough to spend time working W's, we should keep our calls short and contacts brief.

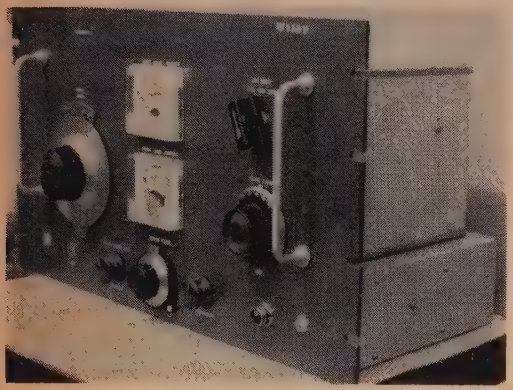
While philosophizing, we should comment too upon the much maligned practice of "tail ending." This operating expedient seems to be the useful property of only a few DXers. Some can do it skillfully and many apparently cannot. A properly timed tail end call is a joy to behold, in the proper circumstances, and often elicited a response from us. With some fellows, however, the "tail end" call ran the entire duration of the transmission from the station with which we were in contact. In other cases the "tail ending" persisted well into the subsequent QSO! Any response to a tail ender, of course, brought forth a deluge of would-be tail enders on the next con-

[*Continued on page 100*]



The ham shack and twenty meter beam.

150 Watts CW For 80-40 and 20



Norman S. Howard, W1JBV
Chief Engineer, WNAB
Bridgeport, Conn.

A three band transmitter featuring VFO, and power supply. Excellent use of the BC-375 tuning unit provides good performance at reduced cost.

Transmitters with a power input of around 150 watts seem to attract more attention than any other power rating. It appears to be most popular to both "ole timer" and beginner alike, and tubes with this power rating are inexpensive and power supply requirements are moderate.

The logical choice of final amplifier tubes is the old reliable 807. The author decided on the easily obtained military surplus 807-W or the 5933. These are ruggedized, miniaturized versions of the 807 and sell for around $1.50 on the surplus market. While inexpensive, they require little driving power in addition to being reasonably tolerant to variations in drive and screen voltage requirements.

Certain design objectives were set up that must be considered:

1) Adequate power output.
2) 3 band operation.
3) Band switching.
4) Stable *vfo* with good bandspread.
5) Adequate metering.
6) Convenient and flexible operation.
7) No specialized sheet metal work.
8) Single unit construction.
9) Precautions against TVI.
10) Key click filtering.

The above electrical and mechanical requirements have been fulfilled in the resulting transmitter design.

Design Notes

After three years' operation with converted surplus ARC-5 transmitters, a rig was contemplated with more versatility and flexibility. Also a need was seen to change the plain and drab appearance of the ARC-5's that would enhance and reflect more attention to the operating position. In other words a new lease on amateur radio life was deemed necessary. Henceforth, visions of a new transmitter appeared and the author thus started thumbing through some old issues of the periodicals to get some ideas on rig construction that would gain this end.

In the June, 1954, issue of *QST*, the article written by W1TRF struck the author's fancy. He used a stripped-out BC-375 tuning unit enclosure as the housing for the entire *rf* section, which was constructed of heavy-gauge aluminum with removable top and bottom perforated covers. This seemed ideal to the author for mechanical stability and sturdiness and also provided excellent shielding for TVI. As W1TRF puts it in his article: "The stripped-out enclosure from the BC-375 tuning unit provide(s) a shielded enclosure that would make any good sheet metal worker really sweat to duplicate." And he is so right!

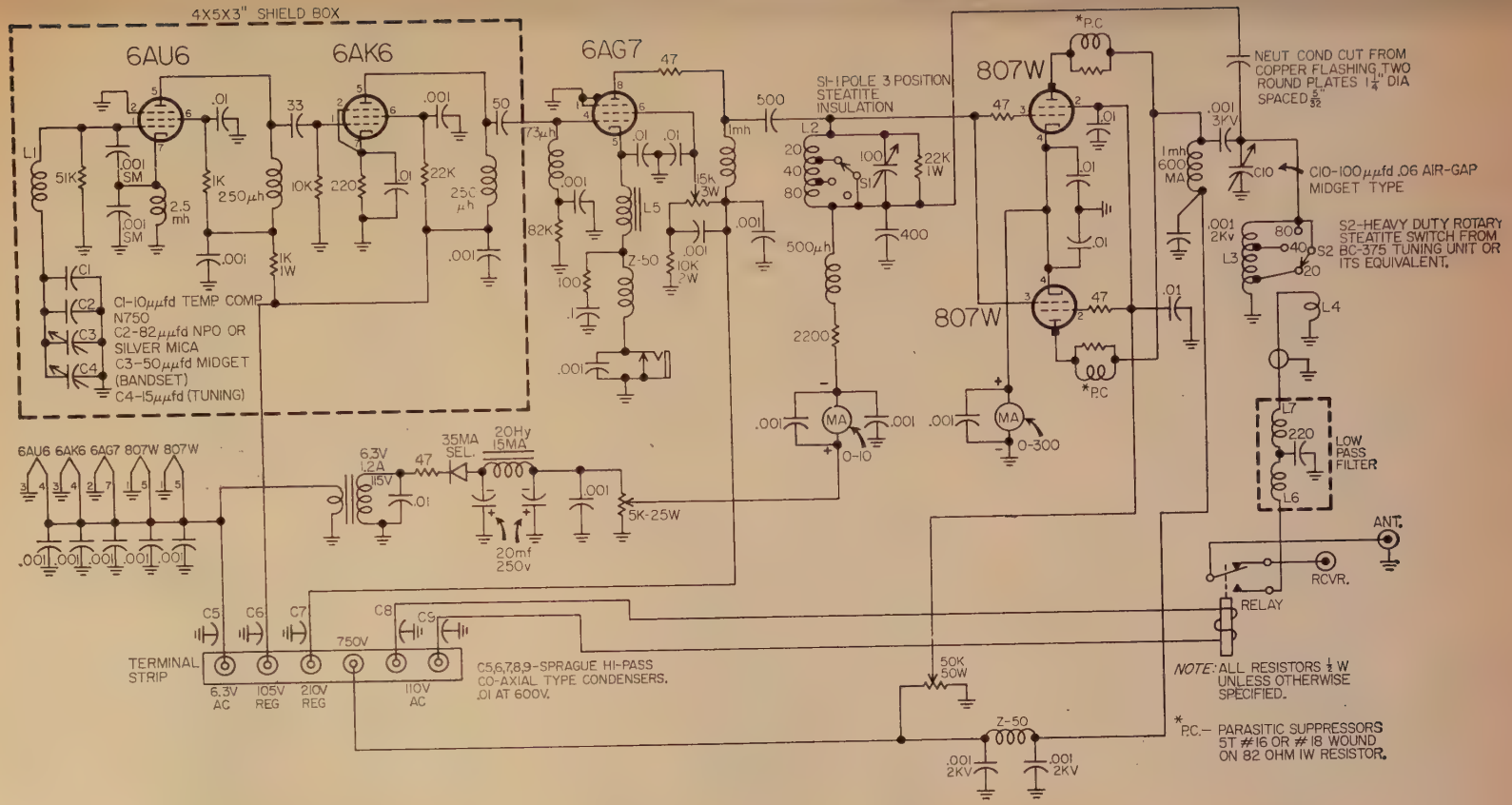
As the author had several of these tuning units in the cellar gathering dust, a rig started taking shape in his mind. These units are still available on the surplus market for around $2.50 apiece and they contain some mighty nice rugged variable condensers, coils, dials and heavy-duty switches. Probably most readers will have one or two of these units lying around, so get to work and strip them down and observe what an excellent shielded enclosure they will make.

Circuit Details

The tube and circuit line-up is shown in fig. 1 and consists of a 6AU6 series-tuned colpitts or so called Clapp oscillator feeding a 6AK6 untuned isolation stage. This stage feeds a high transconductance 6AG7 buffer-multiplier which in turn drives a pair of paralleled 807W's in the final amplifier.

The 6AU6 oscillator operates on 3.5 *mc* and is temperature-compensated with a 10 mmf N750 condenser which holds drift down to a negligible amount due to heating effect.

Checking with the station's receiver, a Hammarlund HQ-129-X, the *vfo* drift from a cold



Coil Data

L1—62 turns #26 enamel close wound on ½" ceramic form.

L2—Air Dux #816, 48 turns tapped at 10 and 21 turns from the plate end.

L3—Cut from Air Dux stock #1608, 2" dia., 8 turns per inch. #14 wire 30 turns. Tapped at 5 and 14 turns from the ground end.

L4—4 turns, same stock as L3. (See text)

L5—3.5 H, 50 ma. Primary winding of small output transformer can be used.

L6, L7—7 turns each, #16 enameled, a ½" dia., ½" long. Mount at right angles to each other.

Fig.1—Schematic of the three band transmitter. Note: Pin #3 of the 6AG7 is not numbered but is shown connected to pin #1.

start and for one hour continuous operation was only a matter of around 3 to 400 cycles. With the circuit constants given in fig. 1, the bandspread on 80 meters is one *kc* per dial division, which offers ample spread on 40 and 20 meters.

The low value of coupling condenser and resistance in the grid circuit of the 6AK6 isolation stage makes the oscillator highly insensitive to anything that happens following it. There is no frequency shift from no-load to full-load conditions. A regulated 105 volts is applied to the *vfo* and 6AK6 stages. This adds to the overall stability.

Buffer-Multiplier Stage

The small coil in the 6AG7 grid return lead is a TV peaking coil (73uhy). A 93uhy peaking coil was also tried and all worked OK. This coil seems to be broadly resonant around 4 *mc* and boosts the grid excitation to the required value when quadrupling to 20 meters. With the addition of this coil, the grid drive to the final amplifier jumps from 1.5 *ma* to 3.5 *ma* when operating on the 20 meter band.

The 6AG7 plate tank circuit uses a tapped coil to change bands, and is shunted with a 22K resistor, which broadens the response of the driver at lower frequencies and aids in stabilizing both driver and final.

The network consisting of an iron-core choke, 100 ohm resistor and .1mfd condenser in the cathode circuit serves as a key-click filter. The potentiometer in the screen leg varies the 6AG7 screen voltage and is used to control the drive to the final. This is necessary when operating on 80 and 40 meters. A regulated 210 volts is applied to the plate of this stage. This stage is keyed in the cathode circuit thru an *rf* filter. If the builder wishes, he may use a 5763 type tube in place of the 6AG7 with no changes in circuit constants.

Final Amplifier

As the 807W's are operated in parallel and the inter-electrode capacities are therefore doubled, it was found necessary to neutralize them. The capacitive bridge method of neutralization is used and works out just fine. As the 6AG7 stage is keyed, fixed or battery bias is necessary on the 807W's. A 6.3 *vac* filament transformer hooked up in reverse to provide a source of isolated 117V *ac*. The output is rectified by the small selenium rectifier, is filtered and applied to the grids to hold the plate current at a safe value under key-up conditions.

Band changing is accomplished by the tapped coil arrangement. Small chokes are used in each 807 plate lead to suppress any *vhf* parasitic oscillation. Screen voltage is supplied by the voltage divider method. A small but effective constant K type low pass filter with a cutoff of around 24 *mc* is used in the output link, together with an antenna change over relay.

Construction

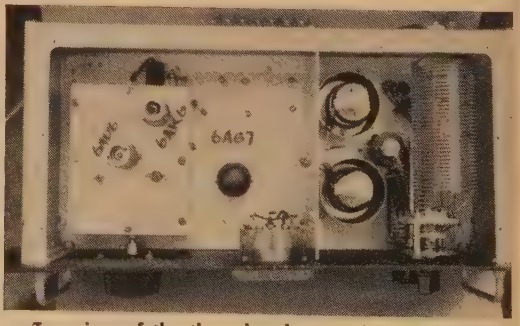
The transmitter is built on a 17 x 8 x 3-inch aluminum chassis, using the enclosure from the BC-375 tuning unit as the housing for the *rf* section. The front panel is a standard 10½-inches high. The two front panel brackets are also from the surplus tuning unit, but can be dispensed with if one desires, although they add to the over-all appearance. The shield partition between the 6AG7 and the 807W stages can be the original included in the tuning unit, or can be made from the bottom perforated cover. This partition is placed 6¼" from the right side. All parts should be mounted and wired before the shielded enclosure is affixed to the chassis and panel.

As observed from the photos, the *vfo* and the 6AK6 stages are built in a 4 x 5 x 3-inch aluminum box, and then bolted to the main chassis with self-tapping screws. This type of construction provides better shielding and isolation, and *vfo* operation, bandspread, and band-coverage can be checked before final attachment to the chassis. All grounds in the *vfo* stage are made to one point, and all grounds in the 6AK6 stage are also made at one point.

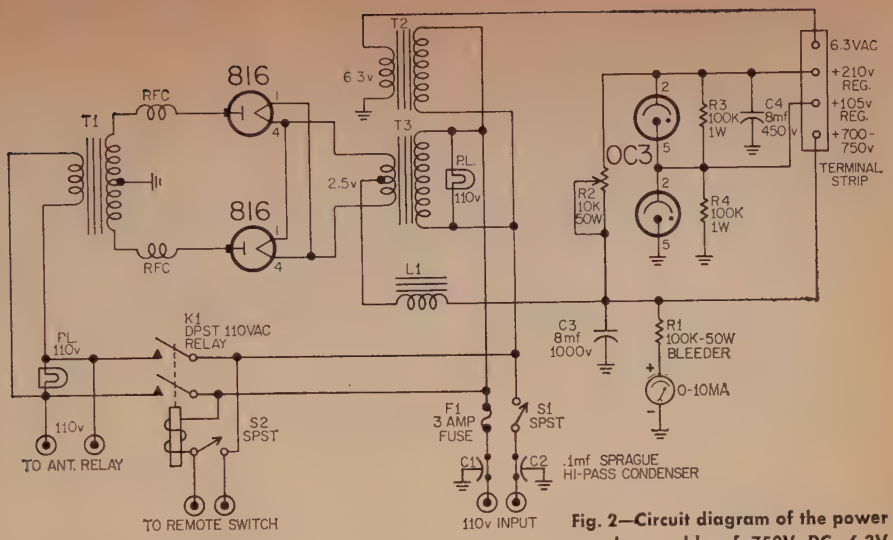
After the *vfo* has been checked to the



Under chassis view of the transmitter showing parts location. The 6AG7 vector socket can be seen behind the grid coil L2. The low pass filter and antenna relay are located in the upper left near the coaxial connector. Front panel functions from l to r; pilot light socket, excitation control, driver tank condenser, bandswitch, and key jack.



Top view of the three band transmitter with the cover removed. The VFO is at the left and the final tank on the right. The 6AG7 is shown mounted on the main chassis, separated from the 807Ws by a piece of perforated aluminum. Mounted directly behind the heavy ceramic bandswitch is the final tank coils, L3 and L4.



T1-PLATE XFMR 750-0-750v, 300MA
T2-6.3vAC, 3AMPS FILAMENT XFMR
T3-2.5vAC, 5AMPS FILAMENT XFMR
L1-4 TO 8Hy FILTER CHOKE
RFC-HASH CHOKE *(SEE TEXT)*

Fig. 2—Circuit diagram of the power supply capable of 750V DC, 6.3V AC, 210V and 105V regulated.

builder's satisfaction, the grid coil is given two coats of "Liquidope" general purpose coil coating. This provides a tough moisture and weatherproof coating and tightens the winding when drying. After this has dried, the whole inside and all circuit components in the *vfo* box, except the variable condensers, is given a light spraying of clear Krylon.

As seen in the photos, the 6AG7 plate coil is supported by the bandswitch. A vector socket is used to support small components, and no special precautions are necessary except all grounds are made to one point at the socket.

Tube shields are used on the 807w's and are 2½" high. The plate tank condenser is bolted to the chassis and is located under the tank coil. The neutralizing condenser is mounted on small stand off insulators behind the tank condenser. The plate tank coil is made from Air-Dux coil stock. The antenna link is made by cutting out one full turn of this stock coil, 4 turns from one end. The coil is supported by the band-switch at one end and by the link feed-thru insulator at the back end. The ground end of the tank and link coils are strapped together and grounded to the side of the *rf* enclosure. From the outside connection of the link feed-thru insulator, a piece of small coaxial cable is run thru the chassis to the low-pass filter adjoining the antenna changeover relay.

As in the other stages, all grounds are made to one point, each 807w tube having its own common ground. Plain insulated hook-up wire is used thru-out the whole transmitter rather than shielded wire usually used for TVI prevention. By dressing the wire close to the chassis, the capacitance from wire to chassis is nearly as effective as the shielded wire. A chassis bottom plate completes the shielding. The transmitter and associated power supply are



mounted in a standard 19 inch enclosed rack.

Power Supply

The complete power supply is built on a 17 x 10 x 2-inch chassis with a 7-inch panel. As observed in fig. 2, it uses a pair of mercury-vapor type 816 rectifier tubes. The *ac* input is filtered with Sprague Hi-pass condensers. The plates-on power switch S2 controls a DPST 110 volt *ac* relay which supplies power to the high voltage transformer. For remote control of the plate power parallel wires from this switch S2 are connected to the terminal strip on the back of the chassis. If the builder wishes to use 5R4GYA type rectifiers he will have to change T3 to provide 5 volts to the filaments and operate the plates of each tube in parallel. T2 supplies heater voltage to all tubes in the transmitter. The 110v *ac* line is connected to the back terminal strip for operation of the antenna change-over relay.

The chokes in the 816 plate leads are mercury vapor hash elimination *rf* chokes. These are the single pie heavy duty chokes that were originally in the BC-375 tuning unit. The meter on the panel is a 0-10 *dc ma* meter connected as a voltmeter by using it in series with a 100 K bleeder. Thus a reading of 5 *ma* is 500 volts

and a reading of 10 *ma* is 1000 volts. Just multiply the meter reading by 100 to determine the output voltage. The meter also serves another purpose—that of an open bleeder resistor indicator. If the meter fails to read it may be because of an open bleeder.

The two VR-105 or OC3 voltage regulator tubes in series provide 105 volts to the 6AU6 and 6AK6 tubes, and 210 volts to the 6AG7 driver tube.

The cut-out window in the panel is for viewing the 816 rectifier tubes, and it is quite a show to observe the blue mercury-vapor flashes when the key is pressed. In fact, one can monitor his own sending by observing the keyed flashes. The frame of the window is from the tuning chart affixed to the front panel of the BC-375 tuning unit. It is complete with a heavy plastic cover, but the author used a beveled glass from an old defunct alarm clock that just happened to be the right size to fit in the frame.

No special precautions are needed in wiring the power supply except to use sufficiently insulated wire in the high voltage leads.

Operation and Adjustment

With the heaters on, the bias supply will be energized and the bias on the final tubes should be adjusted to around 35 volts (negative voltage). This will hold the key-up plate current to around 50 or 60 *ma* for both tubes, and will afford better keying than running the final at cut-off values.

With the circuit constants given and the stated applied voltages, the grid drive current on the final with maximum excitation will be 10 *ma* on 80, 8 *ma* on 40 and 3.5 *ma* on 20 meters. The driver dial settings should be around 10 for 80, 50 for 40, and 90 for 20 meters with the driver plate condenser being fully meshed at a dial setting of zero.

With the driver band switch in the 20 meter position make sure the tank is quadrupling and not tripling, as in this position there will be two settings of maximum grid drive. The one with the least tank capacitance will be the 20 meter setting. This can be checked with a grid dip meter or by using the station receiver. If adequate drive is not obtained on 20 meters the driver can be operated on 40 and the final amp. operated as a doubler to 20.

Do not overdrive the 807 tubes as unstable conditions may arise as well as increased harmonic and parasitic content. Final grid drive of from 4 to 6 *ma* on 40 and 80 meters seems ample, with 3 *ma* on 20 meter band. This can be obtained by the excitation adjustment control which varies the voltage applied to the screen of the driver tube.

The final can feed an antenna coupler or a co-axial center fed antenna, and can be loaded to 200-250 *ma* of plate current. As the *vfo* covers only about 100 *kc* on 80 meters it will be necessary to change the band-set condenser located on top of the *vfo* box if other parts of the 80 or 40 meter bands are to be covered. This can be set by inserting a long shaft screwdriver thru one of the holes in the perforated cover just above this band-set condenser.

This rig proved to be 100% reliable in all respects, and operation is a pleasure on all bands covered. If built to specifications, this transmitter will perform and look well on any operating desk. ■

International Amateur Radio Convention

August 11, 12, 13, 14th, 1960

You have probably noticed that the last two or three issues of CQ contained some mention of the International Amateur Radio Convention which we plan to hold on August 11th through 14th, 1960 at the Statler-Hilton Hotel here in New York City. A convention of this size, is by necessity, a great deal of work. We have been going at it persistently, trying to assure that the show will be a highly successful one; one which will cater to every phase of our hobby. To do this, committees had to be formed, technical sessions and speakers arranged for and programmed and exhibitors solicited. Although we still have not approached completion of the arrangements (and probably won't until convention time) we feel that enough details are available to present you with a pretty fair overall picture of the show that we plan.

Why in New York?

We selected New York City for the location of the International Amateur Radio Convention for two main reasons, one being the simple fact that there has not been a large amateur show in New York City for many years, and secondly because New York offers a wide variety of tours and entertainment for the entire family. We know that a vacation in New York can be a most interesting one. Broadway is literally teaming with the best in theatrical entertainment and recent motion pictures; the area also boasts a preponderance of restaurants and night clubs which have become famous the world over for both varied cuisine and tantalizing atmosphere. The sights to be seen, in themselves, draw millions of sightseers each and every year.

All in all, we feel that if you plan your vaca-

tion or at least part of your vacation in New York City this year you will not only be able to come to what we expect to be the best amateur convention ever held, but also to take advantage of the many other vacation bonus' that this city has to offer.

To insure this, we are arranging to provide services which will; 1)—make theatre tickets available upon request. These of course, are not free but just being able to get good seats can be a problem; one which the Convention Committee is prepared to eliminate. 2)—arrange for tours, such as boat trips, museums, art and music centers, the United Nations and many, many others. 3)—recommend fine eating and entertainment spots based on your individual preferences. This latter service has been arranged by the Convention Hospitality Committee. This Committee will be at the convention and is made up of amateurs who know New York's secrets cold. 3)—There is a Housing & Accommodations Committee which is designed to help you get settled for your stay in the city by arranging for hotel reservations, transportation to and from points of interest etc. This committee is also prepared to help foreign and out-of-town amateurs to take advantage of staying with the many local hams who have offered their homes and hospitality for the period of the show.

Exhibitors

When you come to the International Amateur Radio Convention, you may expect to see exhibits of just about *all* the amateur gear currently on the market. Transmitters, Receivers, Antennas, VHF & UHF gear. . . . Whatever interests you, can be seen at the show. There will also be representatives at each exhibit to answer your technical questions regarding the gear on display.

Prizes

The convention is prepared to give away a wealth of prizes. Aside from a myriad of smaller gifts, there will be 25 or more major prizes. . . . Items which range in price from $25 to $1200 dollars. These awards will be made daily with the exception of the drawing for the major prizes which will be held on Saturday evening, August 13th. Selection for all prizes will be made by drawing ticket numbers so that everyone who has a ticket has a good chance of being a lucky winner.

Technical Sessions

There will be Technical Sessions held during each and every day of the convention. These talks will vary in both length and subject matter. All phases of amateur radio will be covered by technical sessions including: Antennas, Novice, Technician, VHF & UHF, Propagation, YL, SSB, DX, etc. These talks will be conducted by leading amateurs from all walks of life, many of whom have been and are responsible for the many wonderful engineering accomplishments that make todays fine commercial equipment what it is.

Other Features of Interest

Aside from the above, there will be a raft of other fine events at the convention. We will have, for example, a room devoted to operating ham stations. Two or three separate stations are planned which will operate on all amateur bands including VHF with AM, SSB, CW and RTTY being used. These stations will be made up from the best gear available and will be open to all, should you care to have a few QSO's from the Convention. There will also be equipment construction contests, QSL Contests, Code Practice runs, Mobile Judging contests and an exam room where you SWL's can take your Tests.

We have asked both Army & Air Force Mars and Civil Defense to accept booths at the convention. If you are interested in these aspects of our hobby, rest assured that they will be amply represented at the show.

Show Schedule

A complete listing of programs will appear in our July issue. However we have the days broken down into show hours now, so take a peek at the following:

THURS.	*FRI.*	*SAT.*	*SUN.*
10 am-	11 am-	10 am-	10 am-
6 pm	10 pm	10 pm	3 pm

Note that the show ends early on Sunday afternoon. This will give convention goers a chance to start home before the big rush.

Be sure to watch *CQ* for more detailed information on the 1960 International Amateur Radio Convention. ■

Tickets

Tickets for the International Amateur Radio Convention are now available. A ticket good for "Run-of-the-show" (all four days) will cost $5.00, and entitles you, your wife and any harmonics under 12 years of age to admission during the entire convention. For those amateurs that can only attend one or two days out of the total four, tickets are available on a "daily" basis at $2.00 per day. Family privileges as described above also hold true here.

We suggest that you register well in advance, as all indications are that this affair will be well oversold. Make checks or money-orders payable to: International Amateur Radio Convention and mail to IARC, 300 West 43rd Street, New York 36, N.Y.

Reservations

Our Hotel Reservations Committee is prepared to assist "Out-of-Town" amateurs in securing reservations for the period of the Convention. Drop us a line indicating the size of your party and the period in which you require reservations. Hotel rates are available from the Committee upon receipt of your request. A list of shows and other functions which will be in New York City at the time of the convention will also be available from us on about the first of July. See you at the Convention.

Armed Forces Day

Amateur Communications

The Army, Navy, and Air Force invite all U.S. and overseas radio amateurs to participate in the Eleventh Armed Forces Day amateur radio program on Saturday, 21 May 1960.

The program consists of three parts. The first is a CW code receiving contest featuring a message from the Secretary of Defense and is open to any shortwave listener who can copy International Morse Code at 25 words per minute. Each participant who submits a perfect copy will be awarded a Department of Defense certificate of merit signed by the Secretary of Defense.

Part two of the program consists of a radioteletypewriter (RTTY) transmission featuring a special message from the Secretary of Defense to any amateur radio operator or other individual who has the equipment capable of receiving radioteletypewriter transmissions. The message will be transmitted by the Headquarters MARS and Navy radio stations at a speed of 60 words per minute. Each participant who submits a perfect copy of this message will be awarded a certificate of merit signed by the Secretary of Defense.

Part three, the highlight of the Armed Forces Day amateur radio activities, features a military-to-amateur transmitting and receiving test, and will be conducted for all holders of valid U.S. amateur radio station licenses. Headquarters radio stations of the Army, Navy, and Air Force will operate on spot frequencies **outside the amateur bands**, establish radio contact with amateur stations, and acknowledge these contacts with a special one-time Armed Forces QSL card. Each service headquarters station will acknowledge separately so amateurs will have an opportunity to qualify for three different QSL cards.

Competition entries submitted to the Armed Forces Day Contest, Room BE-1000, the Pentagon, Washington, D. C. should be postmarked not later than 31 May 1960.

Complete details are as follows:

A CW receiving competition will feature a message from the Secretary of Defense. All individuals, amateur operators, and others are eligible to participate. A certificate of merit will be issued to each participant who makes a perfect cop. Transmissions will be at twenty-five words per minute on the following schedules:

Time 21 May 1960	*Call Sign*	*Frequencies (KCS)*
220300Z (2200—EST)	WAR/AIR (Army & Air Force radio, Wash., D. C.)	3347, 14405, 20994
220300Z (2200—EST)	NSS (Navy radio, Wash., D. C.)	3319, 4010, 6970, 14480
220300Z (1900—PST)	A6USA (Army radio, San Francisco, Calif.)	6997.5
	NPG (Navy radio, San Francisco, Calif.)	3319, 7595, 14927.5
	NPD (Navy radio, Seattle Wash.)	7455
	AG6AIR (Hamilton AFB Calif.)	7832.5
211100GCT (2000 India)	NDT (Navy radio, Kami Seya, Japan)	2287.5, 4545, 9427.5, 16445, 23010

Each transmission will commence with a ten minute CQ call. It is not necessary to copy more than one station and no extra credit will be given for so doing.

Transcriptions should be submitted "as received". No attempt should be made to correct possible transmission errors. Time, frequency, and call sign of the station copied shall be indicated as well as the name, call sign (if any), and address of the individual submitting the copy.

A radioteletypewriter (RTTY) receiving competition will feature a special message from the Secretary of Defense. A certificate of merit will be issued to each participant who makes a perfect copy. Transmission will be at sixty words per minute on the following schedule:

Time 21 May 1960	*Call Sign*	*Frequencies (KCS)*
220330Z (2230—EST)	WAR (Washington, D. C.)	3347, 14405,
	NSS (Washington, D. C.)	20994
	AIR (Washington, D. C.)	3319, 7375, 14480 7915
220330Z (2130—CST)	A5USA (Ft. Sam Houston, Texas)	5395
	NDS (Great Lakes, Ill.)	7455
	AG5FFR (Randolph AFB, Texas)	7305
220330Z (1930—PST)	AG6AIR (Hamilton AFB, Calif.)	7832.5
	A6USA (Army radio San Francisco, Calif.)	6997.5
220345Z (2145—CST)	NDF (New Orleans, La.)	6970
	NDW (San Francisco, Calif.)	3319, 7375
	NPD (Seattle, Wash.)	7455

Each transmission will commence with a period of ten minutes of test and station identification to permit amateurs to adjust their equipment. At the end of the test period, the messages will be transmitted.

Military stations, WAR, NSS, and AIR, will be on the air from 211800Z (1300—EST) to 220500Z (2400—EST) on 21 May 1960 to contact and test with amateur radio stations. Amateur contacts will be discontinued from 220245Z to 220400Z to allow Armed Forces Day CW and RTTY broadcast competitions. Military stations will operate on spot frequencies *outside* the amateur bands as follows:

Station	*Military Frequencies (KCS)*	*Appropriate Amateur Band (megs)*
WAR (Army radio, Washington, D. C.)	4020 (AM)	3.8 to 4
	4025 (SSB)	3.8 to 4
	6997.5 (CW)	7. to 7.2
	20994 (CW)	21.1 to 21.25
NSS (Navy radio, Washington, D. C.)	4010 (CW)	3.5 to 3.8
	*4012.5 (SSB)	7.2 to 7.3
	3319 (RTTY)	& 3.8 to4
	6970 (CW)	3.5 to 3.8
	7375 (RTTY)	7. to 7.2
	14385 (SSB)	7. to 7.2
	14480 (CW)	14.2 to 14.3
	20075 (CW)	14. to 14.2
	**20050 (RTTY)	21. to 21.35
AIR (Air Force radio, Washington, D. C.)	3347 (CW)	3.5 to 3.8
	7635 (AM)	7.2 to 7.3
	14405 (SSB)	14.2 to 14.35
	15715 (CW)	14. to 14.2

*Operator transmitting on 4012.5 (SSB) will listen in the AM, SSB, sections of the 40 and 75 meter bands for AM or SSB stations.

**NSS will key 20050 KC simultaneously with one of the RATT frequencies listed above. This frequency will be utilized as frequency propagation conditions dictate.

Military stations will listen for calls from amateurs **within the appropriate amateur bands.** Contacts will consist of a brief exchange of location and signal report. This is a test of military-to-amateur communications and no traffic handling or message exchange will be permitted. A QSL will be sent to each amateur station worked. Each of the military stations will acknowledge separately. ■



On Friday and Saturday, May 6th and 7th, the Dayton Amateur Radio Association will hold their ninth annual "Hamvention" at the Dayton Biltmore Hotel. A cordial invitation is extended to all radio amateurs, their YL's, XYL's and others interested in amateur radio. You will be able to visit the exhibit booths of leading manufacturers and distributors of amateur radio equipment.

Program Highlights

May 6

1800-2200—Registration
1900—Open House
1900—VHF and SSB Dinners
1930-2130—Exhibits Open and Prizes on Display

May 7

0070-1700—Registration
0730-1800—Exhibits Open and Prizes on Display
0900—General Class Exams
1300—Novice and Technicians Exams

Technical Program

0900-1000—*"Practical Application of Transistors in Amateur Radio"*. Gilbert Whaite, K3AWI, Field Engineer, Philco Corp.
1010-1100—*"An Electronic Keyer"*. Jim Ricks, W9TO, Consultant, The Hallicrafters Company.
1110-1200—*"Recent Developments in Multiband Antennas"*. Andrew Andros, WØLTE, Pres. Hy-Gain Antenna Products.
1340-1430—*A.R.R.L. Forum*. Ed Tilton, W1HDQ, VHF Editor *QST*, ARRL.
1440-1530—*"Engineering Problems of Commercial Ham Gear"*. Roger Mace, W8MWZ/Ø, Vice President, Engineering, Globe Electronics.
1540-1630—*"A Sober, Serious Inside Look at the Geneva Conference and Its Meaning to Amateur Radio"*. George Jacobs, W3ASK, United States Information Agency, Voice of America, and Propagation Editor of *CQ*.

Forums

0900-1200—*Sideband Forum* Moderator, H. E. Ruble, W8PTF *"Operation and Adjustment of Linears"* by A. M. (AL) Pichitino, WØEDX, Chief Engineer, E. F. Johnson Co.
"Generation of Single Sideband Signals," by Robert E. Bean, W9BGZ, Professor of Electronics, Northwestern University.
0930-1200 — *DX Forum* Moderator, Earl French, W8ZOK.
"Problems Confronting A DX Editor" by Urban LeJeune, Jr., W2DEC DX Editor of *CQ*.
A Surprise Program Put On by the New Jersey DX Club.
1400-1700 — *VHF Forum* Moderator, Larry Brandenburg, W8TEK. *"Ham TV,"* by John Hall, W8RRJ, Research Engineer, North American Aviation.
"1296 Mc. Moon Bounce Project," by Sam Harris, W1FZJ, VHF Editor of *CQ*.
"Getting More Out of VHF," by Ed Tilton, W1HDQ, VHF Editor *QST*.
1440-1700—*RTTY Forum* Moderator, A. B. Henderson, W8WYL. Byron Kretzman, W2JTP/KØWMR, RTTY Editor of *CQ* will take part in the forum along with Burton Jaffee K9BRL/W8CKW General Manager, Electrocom Industries E. N. Shook, W8ZYW and C. G. Dews of the Ohio Bell Telephone Company.

A few of the many fine pieces of amateur equipment which will be awarded following the grand Banquet will be a Collins KWM-2, HT-37, SX-111, and a Mosely Tri-Band Rotary Beam.

This should be a bigger and better affair than ever. C.U. at Dayton! ■

DX DX DX DX DX DX DX DX

Urban Le Jeune, Jr., W2DEC
416 North 15th St., Kenilworth, N. J.

The following certificates were issued between February 15th and March 14th, 1960:

DX

		WAZ
#1291	UA9VB	Victor Priahin
#1292	W1TSL	William S. Squadrito
#1293	W4DKP	William H. Aycock
#1294	W3MVQ	William S. Ashe
#1295	W3EFZ	Richard P. Scott
#1296	W8CRI	Harry H. Porter
#1297	W1WLW	Calvin M. Watson
#1298	K9CAZ	William Baxter
#1299	DJ4DN	Gunter Zobel
#1300	K6ZMB	J. H. Almgren
#1301	VE5VL	Victor Leroi
#1302	HB9TL	Jack C. Laib
#1303	DL6EQ	Rudi Brumm
#1304	W9MBF	W. C. Halverson
#1305	I1UB	Mario Passeri
#1306	LA5HE	Ragnar Otterstad
#1307	W2FCQ	Vernon F. Clifford
#1308	K4CTU	Joseph S. Rosko
#1309	W8ILG	Harold A. Smith
#1310	W1HX	Norman H. Young
#1311	WA6EYP	John C. Papp
#1312	JA3AA	Isaji Shima
#1313	5A5TO	Fred A. Vitringa
#1314	K9IYW	A. O. Walker
#1315	W8MTQ	William White
#1316	W9WNB	William S. Moore
#1317	WØMCX	Arthur A. Jablonsky
#1318	W9PIO	W. A. Grob
#1319	SM5AEQ	Arne Andersson
#1320	K9CLO	William H. Branche
		All Phone WAZ
#53	JA1ACB	Gin S. Naniwada
#54	GI3KVQ	Stanley K. Orr
#55	G3FKM	John Allaway
		CW WPX
#103	PAØVB	P.v.d. Berg
#104	OK1KKJ	Podebrady Radio Club
		Phone WPX
#13	PAØHBO	Henry P. J. Bouwma
#14	5A5TO	Fred A. Vitrimga
		SSB WPX
#23	W8YIN	Mickey Unger
#24	HB9TL	Jack C. Laib
#25	DL4AS	Marcus E. Rinks



WPX Box Score

CW WPX

W2HMJ	553	WØSNL	327	W6RLP	3
W6KG	511	DL3RK	324	OK1AEH	3
W5KC	461	K9EAB	319	SM5CCE	3
K6CQM	455	EA4CR	318	W1FZ	3
W8KPL	453	G3EYN	318	W8UMR	3
W2EQS	429	DJ1VS	316	W9VIN	3
OK1MB	428	VK6WT	316	K9CLO	3
W5AFX	407	W2GT	316	W3DBX	3
W1EQ	400	F9MS	315	W5LGG	3
W1NLM	400	PAØVB	315	WØDMA	3
W2MUM	400	PAØVO	315	JA2JW	3
W9UXO	390	W1IUU	313	LU5AQ	3
W4OPM	387	SM5WI	312	PY4OD	3
W3BQA	385	SM5AHK	311	SM5AJU	3
K4JVE	377	W2HO	311	W2DGW	3
K6SXA	376	W5BRR	311	W4HYW	3
W2PTD	374	W8RQ	311	W4IMI	3
W9YSX	368	PAØLY	310	W8IBX	3
W9DYG	367	W3GHD	310	W8TTN	3
W4AZK	365	W9BPW	310	WØGUV	3
W9QGR	361	W3AYD	309	WØQYE	3
VE3DIF	357	DJ3BB	308	K4KOY	3
DL7CS	356	SM5BCE	308	KL7MF	3
W5OLG	356	W9YNB	307	OK1KKJ	3
W6WO	356	DL1QT	306	PY4AO	3
W8LY	354	K4IEX	306	VE3CIO	3
K9AGB	354	K5LIA	306	W1HWH	3
W5AWT	353	OK3DG	306	W2FXA	3
WØPGI	353	UA9DN	306	W3BCY	3
W5DA	351	W8RSW	306	W3LMA	3
VK3KB	350	K4HXF	305	W4GXB	3
W8JIN	350	SM5AHJ	305	WØMCX	3
W1IJB	349	VE3BWY	305	W3UXX	2
W9IU	344	W5AZB	305	OK1BY	2
K2UKQ	339	WØGUV	305	W4OMW	2
K2PFC	335	K5JZY	304		
W6YY	330	W1BFT	304		

Phone WPX

W8WT	475	5A5TO	353	F8PI	3
G3DO	424	W5ERY	315	PY1NC	3
CT1PK	409	ZP5CF	306	W9UZC	3
PAØHBO	363	DL3TJ	305	VE1ADE	2
PY2CK	354	SM3BIZ	304		

SSB WPX

T12HP	231	K2HEA	160	K2JFV	1
HB9TL	221	TG9AD	160	W5RHW	1
K9EAB	204	MP4BBW	158	W8YBZ	1
K2MGE	203	W8YIN	157	WØFUH	1
W1GR	203	WØCVU	155	W5DA	1
W6BAF	170	W3VSU	154	W6TNS	1
DL4AS	166	W2OTZ	153	XE1AE	1
W3MAC	165	W2TP	153		
VE3MR	164	W2VZV	153		

The ever popular Ken Bale, EL4A. It looks as though Ken's equipment is about to push him out the door. Ken, who is W7VCB, stateside is a true all-band enthusiast.

Due to a mistake a few WAZ certificates were nailed in ordinary envelopes and were subsequently damaged in the mail. If you received one of these or if your's is overdue please let me know and I'll have another one issued.

AP4—EAST PAKISTAN—AP4UN is supposed to be in East Pakistan. He is active on 14 *mc* CW. Should be a new country. (Tnx W6YY). By the time you read this W5PQA (ZM7DA) should be on from the American Embassy in Dacca, East Palistan. (Tnx NCDXC)

BV1—FORMOSA—BV1USE will close operation May 1st. A new operator will be there shortly. QSL via W9HCR, M/Sgt. Don Meredeth, Madison, Wis. (Tnx W2AFQ)

CEØ—A 500 to 700 watt transmitter is being shipped to the gang at CEØAC. They will be active on CW and phone. (Tnx WGDXC)

FB8 — MADAGASCAR — FB8CG has Ted Henry's Argonaut SSB transmitter on 20 meters. (Tnx W6YY)

FB8—COMOROS—FB8GP is a new station on the Comoros. He is active on 14 *mc* CW. FB8CD's *bfo* on his receiver is not working so he is only working phone. (Tnx NCDXC)

FP8—ST. PIERRE—K2LSU, K2TVY and K2OQA are taking a Viking II and SX-100 to St. Pierre during the first two weeks in August. They plan to operate 15, 20 and 40 meters and 10 meter phone. QSL via K2VZJ.

HC8—GALAPAGOS—HC8JU cards are being rejected for DXCC as it was "a shipboard operation".

TA—TURKEY—TA3GI has been operating under cover in Turkey using a KWM-1. QSLs should go via VE7ZM and not direct. (Tnx WGDXC)

UAØ—WRANGEL ISLAND—According to UA1DZ, there is activity from Wrangel Island. He thinks the call is UAØBQ. (Tnx NCDXC)

VK2—LORD HOWE—ZL2GX will help with skeds with VK2FR. Ditto with ZL3VB on Chatham. (Tnx WGDXC)

VP9—BERMUDA—The VP9 boys are sponsoring their popular contest again this year. See W1WY's column for full details. First prize is an expense-paid trip to Bermuda for two for one week. The VP9 field day is June 11th to 12th from 2000 AST to 1700 AST.

4W1—YEMEN—OK7HZ will *not* be able to operate from 4W1 because of lack of license. (Tnx WGDXC)

160 Meters (Tnx to W1BB) Through the cooperation of KV4AA, Dick Spencely, the blessings of Danny Weil, and the particular enthusiasm of technical crewman Dave Tremayne, ZL1AV, the Yasme III will sail, all set for contacts on top band wherever conditions permit. Particular thanks goes to Leo Meyerson, WØGFQ who donated a Globe King 500C capable of 500 watts CW and AM including 160 and 750 watts SSB all bands excetp 160. Mention should also be made of the help and enthusiasm of Jimmie, W4KAC, who assisted



As a gesture of good will and American friendship for overseas radio amateurs, K6BX, Clif Evans, has established a central clearing office for information: First, for American amateurs who desire to mail their "expired" copies of Call Book Magazine to overseas hams who would appreciate receiving the Call Book, and secondly, for overseas Amateur friends who desire to be placed on the mailing list for the gift of one of these expired but usable books.

This is a person-to-person friendship project and books will be mailed directly from the American Ham offering it. The names and calls of individual overseas Hams rather than Clubs is desired.

Names or lists of names should be air mailed to K6BX, Clif Evans, Box 385, Bonita, Calif., U.S.A.

W1BB in sparking this 160 meter deal for YASME III. We were about to purchase and forward a transmitter, when Leo Meyerson came forward and donated the 500C solving all problems—Many, many, many thanks to Leo, and Globe Electronics.

Message from K6RAN says they are now using, of all antennas, a 455 ft. vertical unused BC antenna. K7HDB says it is putting a signal 2 S units better than any other W/K6. Howard, K6RAN, says they will use tower until March 30th. They truck up gear to the site each weekend. Four hundred and fifty-five feet is about 1 full wave on 1995 *kc*. Believes wonderful radiation due largely to fabulous system of ground radials. WØGBV gave them 30 over 9, W5SOT 10 over 9—HOWEVER . . . Alas . . . it isn't so hot—yet! That is, on receiving. RX is full of BC birdies and harmonic BCI, so it is difficult to hear anything too well unless quite loud, so for DX there is a big question. Here is one you must listen for fellows and send Howard your reports AirMail if you can't contact him. He sure deserves credit for this energy and unusual activity which will be interesting to all of us At 0800 GMT, he makes special tries to the east.

Dick Carruthers, Warrenton, Oregon has volunteered to publish a 160 meter antenna handbook, and print and distribute the same free except for postage. It will be based on the experience of all of you 160 meter guys. The idea is this—anyone with unique or general interest tested ideas for 160 meter antenna construction, feeders, feeder tuning and matching







Three widely worked and popular SP's from top to bottom SP8MJ, SP9EU and SP8EV. (Thanks to K2UKQ for these pics)

networks, communicate with him, P. O. Box 1231. Include a schematic in which all values are indicated. Pictures can be used if they are of good contrast and are in focus. All contributors will get full acknowledgment and a free copy of the booklet. For his sake, be concise and exact. Booklets will be available from K7HDB or W1BB on receipt of S.A.S.E., 12¢—if enough of you fellows contribute sketches and ideas enough to make it worth while. Fair enough, isn't it? Many thanks to you Dick, you who are bubbling over with interest and excitement : having "found" good old 160 meters again . . and enjoy it. Incidentally, Dick is on the a himself every weekend—look for him.

Got a letter of commendation from Dept. c Defense, Atomic Support Agency for observ tions on SL3RB reception during the Atom Tests when his signals peaked up greatly. The say that signal peaking *does* occur after atom blasts, lasting for few minutes. Quite unpredic able, due to increase in ionization below layer. Possibly "ducting" effect is present, in creasing signal. It is stated that they are cog nizant of 160 meter properties and anticipa that the band should improve materially ove the next few years. Peaking in 1964 with con ditions as good or better than the last peak c 1951. They state that further amateur coopera tion may be requested if atomic testing resume Willie was right on the ball and is to be com plimented for his observations.

Letters

The following letter from The Reveren Director of Vatican Radio, concerning th operation of I1ADW/HV, was received by Ma Meyers, W2BIB.

"Dear Sir,

In answer to your request, I say: 'by th Vatican State authorities it has been made clea that permission was never granted to Si D'Agnello Guglielmo, from Lucca, Italy, fo operating an amateur radio station from Vatica City and that such operating has never take place'.

At present the only authorized amateur radi station is HV1CN.

Sincerely yours,

Director"

Mickey, W8YIN, has recently been appointe as SSB DX Editor for the Sidebander and als for the Western Radio Bulletin. Mickey has se up the following schedules during which time h will be QRV to take and pass along information

Schedule I (daily)
2130 GMT to 2200 GMT on 14280 *kc*
Schedule II (whenever possible)
1830 GMT to 1900 GMT on 14280 *kc*
Schedule III
Monday, Wednesday, Friday and Sunday
0130 GMT to 0200 GMT on 21430 *kc*
Schedule IV
Tuesday, Thursday and Saturday
0030 GMT to 0100 GMT on 28680 *kc*

Mickey's feelings on the additional portion o the 20 meter phone band is: "I suggest that th additional 50 *kc* be used strictly to establish contact with DX stations. If the DX statio wishes to 'rag chew' both stations should QSY below 14,300 *kc*. Also, I suggest that Side banders go no lower than 14,250 *kc* so that the U. S. AM stations will have 50 *kc* to them selves." Mickey's QTH is Mickey Unger W8YIN, 8329 Hendrie Blvd., Huntington Woods, Michigan.

The following letter was received from John, W4JZN: "A radio club is being formed at the new Naval Facility near Catania, Silicy. At present there are only a few hams attached to this facility, some of whom are former ZBI's and all, of course, are W's and K's.

A request has been submitted to the Italian government for a station license and in the near future (we hope) the ten, fifteen and twenty meter bands should be jumping with this new "IT1" station.***"

John's QTH is Box #1, Navy #555, U. S. Naval Air Facility, c/o Fleet Post Office, New York, New York.

Many of you have probably received this *"$1.00 required for equipment maintenance before I can send you a QSL for our QSO"*, type of card recently. John, W6YY, passes along one W6's amusing reply.

"Dear OM: Thanks for the letter reecived from you and I am very sorry to hear of your station's poor equipment condition and your extreme financial plight.

It so happens that I too, am in a likewise condition. I live in a house made of old packing-cases down here by the City dump and stand in constant fear of being evicted as a squatter. I have a heck of a time making ends meet to buy food and shoes for my sickly wife and seven children.

The only reason why I am able to get on the air is because of the geenrosity of the radio hams in this area who feel sorry for me and sometimes donate their cast-off equipment to me to use. Often I have to go out and look into the heaps to see if I can't find an old radio tube that somebody has thrown away as a replacement for my battered receiver.

If I was able, I would be only too glad to send you the dollar you request for the QSL but as I have been unable to work for many months and my wife badly needs that operation, we have been putting off for so long, I just cannot scrape the necessary amount of cash together at this time.

I trust that you will understand my poor condition—quite similar to yours—and that you will send me your QSL."

P. S. he got the QSL.

QTH's

K6GMA, who is the QSL manager for VS4JT and VS6AZ, has a new QTH, 13841 McMains St., Garden Grove, Calif. . . . Chris, K1IVT, who is the recent recipient of the second Novice DXCC has the CQ contest logs of FE8AH and will be glad to help anyone needing a card for this period. His QTH, 36 Wesskum Wood Road, Riverside, Conn.

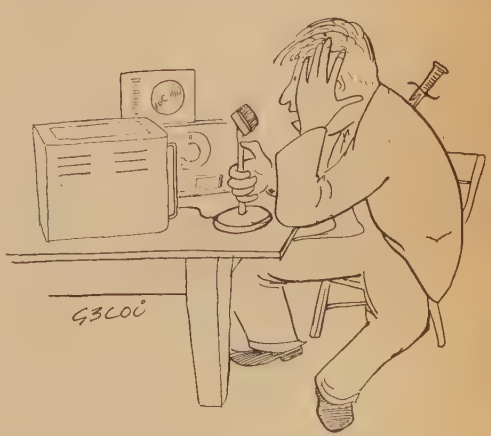
9N1GW	via W7PHO
CN8JT	via W8UWT
CR6AI	Joao C. Chaves, P. O. Box 64, Caala/ Huamba, Angola
HP9FC/VQ8	via VE7ZM
UAØKQB	Station UAØKQB, DOSAAF Radio Club, U1. Yaroslavskogo 11, Yakutsk, U. S. S. R.
VKØAB	via VK3APV
VP2KH	via W2CTN
VP5AB	via W3AYD (QSO's after 1 March 1960)
VP8CC	via G3JAF
VQ6GM	Box 164, Berbera, Somaliland, Proctectorate
VR3Z	via RSGB
VS1KM	via W9ZRG
VU2XG	via G8VG
YN4AB	via K4ASU
ZL5AA and ZL5AC	via ZL2GX



Dave, W6PHF, and rig. Not seen to the right is a pair of parallel 4-400's. Dave also served as a maritime mobile operator. While in Tahiti, he was granted the call FO8AW. Present total is 198 countries worked.



This is the well-equipped station of EA7JH, Manolo, who can be found on any band Phone, CW or SSB.



Sorry for the delay but I've just had my first TVI complaint.



ham clinic

CHARLES J. SCHAUERS, F7FE/W6QLV

CQ Magazine, 300 West 43rd St., New York 36, N. Y.

New Receivers From Old

Unless you are an electronics engineer who knows his "stuff"—with a lot of time on your hands and willing to spend a good number of dollars for special components, you can seldom take your old SX24, SX28, NC100, HRO, KP81, NC81, Super Pro, Breting 12 or 15 etc., apart and make it equal the performance of today's modern receivers. But judging from the letters received on the subject of "soup-up" by HAM CLINIC, there are evidently many owners of old sets who feel that it *is* possible.

Well, maybe so, but it is not easy; regardless of your approach.

I still own and am sentimentally attached to an old SX28A which I have modified everyway that I know how and still it does not operate like the SX101! Gosh, there's a heap of difference! And there should be—for after all, many strides have been made in receiver design since the conception of the 28.

The one B-I-G thing that has made manufacturers plunge into precision receiver design is SSB—this communications mode will weed out the "lemons" in a big hurry.

Today's receiver in order to be accepted by the serious ham must be part frequency meter and "signal inhaler." There's little "guess and by gosh" tuning tolerated today. For when Joe says he's going to 14,293 he means 14,*293* and not 92 or 94!

With due respect to all other set manufacturers, *Collins* did set the stage for the competition that exists today in precision receiver design. But remember the howls that went up on *price?* Then when the ham realized what it *was* that he was getting he simmered down and began buying the 75A series without a second thought.

What he bought and continues to buy today is mechanical and electrical precision, but this is not now limited to Collins equipment.

How anyone can take one of the old sets mentioned above and "turn" it into an NC303, SX101, HQ180, RME 6900, 75S1, NC400, etc., is beyond me! Certainly, small changes can be made which will improve the signal to noise ratio, limiter action, selectivity and so on, but not on a "wholesale" basis.

The first thing that most hams with old receivers think about (when thinking about set modification) is using some of the new so-called low noise tubes. *Ah,* (they think) *more gain and less noise.* Maybe! What did you say the *Q* of the *rf* coil is? How many *if* stages did you say the set has? How many tuned circuits over all?

Q multiplier for better selectivity? Sure—up to a point.

Frequency stability? *Oh, just slap in a vr tube in the oscillator*—oh yea? What about those mica trimmers and those bypasses that suffer from "temperaturitis?" How about those coils that just "delight" in expanding when warm?

Hum? Maybe dry electrolytics.

Images? *Good gosh, guess I need a new conversion circuit 'er sumpin'.* Brother, you certainly do.

Now I did get my old receiver working so that it would receive sideband (*for awhile*); but with all the NPOs I used, VR tubes and special tube heat sink shields, she still wouldn't stay put as one of my new modern receivers does.

Slipping dial mechanisms? Big problem, especially if your dial is celluloid and turned by friction. No advice here.

Mechanical filters? Yes I guess you can install one, but $35.00 is a big price to pay for a filter to install in a set worth $55.00!

Product detector? Ok if your set is already stable. But a PD isn't worth a hoot in a set that drifts with the hours. Stability is essential for SSB unless you want to wear out your good hand tuning the set between *vox* operations.

Nearly anything you do to an old receiver to improve its operation is, at best, a passive measure. Although I have explained this numerous times to HAM CLINIC readers, I always get about the same answer. It runs something like this: "Look, I don't have the money to spend on a new receiver and I would like to get this operating a mite better; so give with the info!"

Even with the help of certain manufacturers I can seldom come up with enough good solid information worth considering. However, I will summarize what I have told many readers.

Most old receivers will drift frequency-wise because there is nothing to prevent part aging—except new parts. VR tube regulation is cer-

ainly a must for frequency control stages—
oo, when this fails perhaps even a filament bal-
ast tube must be added. Stability of *any* oscil-
ator (including crystal) is influenced by
emperature and mechanical layout. (Ever try
o prevent a tuning gang in one of the older
ets from rocking? Tough!)

Adding a pre-selector may help the *rf* input
ituation; but the mere replacement of one *rf*
ube with another without considering the over-
ll efficiency of the aged coils accomplishes
ittle. Ever try to align a set having a warped coil?

What noise limiter? That is a *question!* One
imiter will work fine with the old SX28A, but
ry it on the old NC80—maybe it will—maybe
t won't. TNS? Well, it is good but again it takes
lot of on-the-bench experimentation to make
t work the way it was designed to; this being
specially true when an attempt to use it is made
vith some auto receivers.

Filters? Yes and no. It depends on available
f gain and overall *if* design.

Resistors age too. These cause more noise than
ou can "shake a stick at." An old set can be
epped up quite a bit by measuring and chang-
ng resistors that have shifted value (usually *up*).

But regardless of what you do (within rea-
on) the "old faithful" won't compare with the
atest sets. Perhaps you are one who is satisfied
just as she is." Good, I won't try to change your
nind by suggesting that you try a *Heath Mo-
awk* or some other good modern set and I *will*
ontinue to try and help you get the most out
f what you have. But for goodness sakes fel-
ows, don't expect me to re-design your re-
eiver; there just isn't enough time to do it!

Observation

Power vs Common Sense—Having a KW on
he air is fine, that is every American ham's
rerogative. You can even brag about it to some
f your foreign contacts who use only 50 watts
nd you can scoot up to the top of 14 *mcs* and
last your way through all the low-powered DX
tations too if you want to. But *if* you do, you're
ertainly not a "ham-ambassador of interna-
ional goodwill!"

Why some of you "birds" with KWs on the
air won't cut down your power (especially when
you are on SSB) *and operating in a DX portion
of the spectrum* beats me! It should be *standard*
practice to reduce power when you know you're
barreling in 25 over 9!

A kilowatt is a lot of power—especially when
it is competing with a 3W8's 45 watts. Perhaps
you do need a KW to poke through U.S. QRM,
but by golly if you can hear that 4X4 with his
100 watts you can certainly reduce your power
to 200!

Having a KW does not peg you as an out-
standing engineer or give you one little special
privilege. I see no accomplishment in being able
to work any DX station you hear—because of
your power.

But the yokels who gripe me most are those who carry on a local contact (in the same town or city) using KWs; if this is ham radio and consideration for fellow hams then I'm an "ape's uncle."

Observed: There are too many *"thoughtless KWs"* around the bands these days. Let's give the QRP *many* a chance; reduce your power if your contact can hear you—this is only common sense and for *your* information is required by regulations. Remember the part that goes: "transmitter power should be confined to the amount necessary for effective communications?" Cut down that 2000 watts PEP; *you don't need it!* (Let the brickbats fall where they may —this is my personal stand. I've operated 50 *kw* military transmitters and 250 milliwatt transistor rigs; it takes more than power to QSO—it takes some operating ability too.)

If you want to see what low power can do, read "You Don't Need A KW" by Mickey Unger (W8YIN) in the October issue of *CQ* for 1956. This guy with 263 countries, 143 on SB and 189 prefixes, shows you that high power isn't always what it is cracked up to be.

The Ham And The SWL

Most practicing hams were once shortwave listeners (SWLs)—including me. I feel that every SWL *is* a potential ham and should be encouraged to give amateur radio a closer look. They should be invited to local radio club meetings and helped with their antenna and receiver problems.

Let us hams show the real *HAM SPIRIT* and offer our technical and other assistance to those just getting started.

HAM CLINIC will endeavor to help all SWLs who write in. It would especially like to receive reports on 15 meter receiving conditions.

Our Hats Are Off!

If you are a ham, you should belong to the ARRL—for one good solid reason, read W1-BUD's and W1LVQ's report on the Geneva Radio Conference in the March 1960 issue of QST starting on page 55. WELL DONE!

Final Word On Phonetics (Real Final!)

Well, after all the letters received by HAM CLINIC lampooning the I.C.A.O.-N.A.T.O. phonetic alphabet, the Geneva Radio Conference *adopted* it for world-wide usage—"lock, stock and barrel." So A *IS* Alpha, W *IS* Whiskey, Z *IS* Zulu etc. *Sometimes* HAM CLINIC *is* right in its prognostications! . . . - . - ! (Wonder if the ARRL will now go along?)

Questions

Squelch—"How about a diagram of a one tube squelch circuit that works?"

See fig. 1. This circuit uses only one tube, a 6U8. It must be used with a set having *avc*. As you can see, this squelch is inserted between the 2nd detector and the *af* volume control. Good filtered *dc* must be applied for proper action.

Beam Directivity—What are the main factors to be considered for maximum directivity of a beam antenna?

Spacing of elements, proper tuning (length of elements) and diameter of elements; these control gain too.

Ground Plane Impedance (s)—"What is the impedance of a ground plane antenna?"

I imagine you mean *input* impedance. Well,

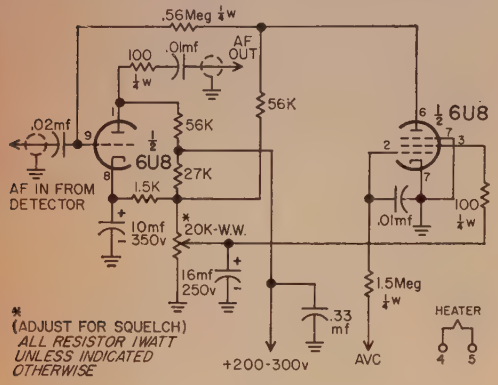


Fig. 1—Squelch Circuit Using One Tube

it can be 50, 80, 20 or 25 ohms. When the ground plane rods are below the horizontal you'll have 50 ohms. If you fold back the radiator (vertical) on itself you'll have 80 ohms. With an elevated ground plane at right angles to the radiator you'll end up with between 20 to 25 ohms.

Radiation Resistance—"Does the radiation resistance of a ½ wave antenna vary with height?"

Sure does, especially a horizontal which can approach 100 ohms at between a ¼ and ½ wavelength in height. A vertical ½ wavelength long at exactly ½ wavelength above ground is about 70 ohms.

Oil Furnace "I"—"I get a lot of noise in my receiver when the oil furnace starts up. I don't know if it is the motor or the ignitors. What can you suggest?" (From a card without an address.)

Install a spark plug suppressor and line filter, bond the motor, burner and furnace together.

Converter Using 12 Volt Tubes—"Seen any converters around lately using 12 volt tubes (plate and filament)? Where? I need one for my mobile recciver."

In the February 1960 issue of the "*Blurb*" published for the Philmont Mobile Radio Club and edited by Charley Stouth (W3ZPP), there is full information on a 12 volt converter using two new 12 volt tubes; by K3GNM. I feel that 25¢ will get you a copy of the diagram if you'll write Charley at 261 Prince Frederick Rd., King of Prussia, Pennsylvania.

Rectifier bye-bye—"I note on my Apache, of late, that my plate voltage varies over 200 volts when I modulate the rig. What's the answer?"

Gosh, turn her off and check your 5R4GY rectifiers—one is no doubt gone. While you are at it, take a look at your filters and bleeders through the eye of your ohmmeter.

Flat Final—"My homebuilt rig doesn't operate as before. No matter what I do I can't seem to get the final to dip deep enough. All voltages etc., check okeh. There's plenty of drive to the final. Where's the gremlin?"

In your final tube no doubt—it is flat—full of gas.

Shure Rule—"What do you suggest for making problems in reactance easier? Gosh these charts and so on throw me!"

Send 75¢ to *Shure Brothers Inc.*, 222 Hartrey Ave., Evanston, Illinois for their Reactance Slide Rule. It's tops—like their mikes.

TR Noise—"My new TR switch (which I connected up according to the manufacturer's instructions) seems to introduce a lot of noise into my receiver on transmitter standby. How come?"

What TR switch and *what* transmitter? (Note readers, please give full info on the gear you have when requesting technical help.)

Well, it is difficult to advise you in *your* particular case. But most tube type switches are connected so that the antenna is *always* connected to the transmitter proper; connection to the receiver being made through a capacitor to the input grid of the tube from the transmitter final.

You may have to bias your final stage to FULL cutoff. Where you get your plate voltage for the TR tube is important. Make sure it is enough but not too much. If you pull the voltage from one of your lower powered stages, make sure that you use at least *two* decoupling resistors, well by-passed to ground (with a electrolytic if possible).

TR tubes *can* oscillate parasitically. I always put a parasitic choke in series with the plate of the TR tube. Also, an improperly designed and installed TR can cause TVI.

Do check your tube in the TR and also the input coupling capacitor—it could be leaking. Make sure the TR case is grounded well to the transmitter and the receiver. Loose coax connectors can sometimes cause noise too.

Try a ½ watt neon bulb across the grid of the TR tube in series with a 500K ½ watt resistor to ground. This may help the noise situation a little. I'll bet your noise is from the transmitter and NOT the TR switch.

Torodial Transformer—"I need a torodial transformer which when used with transistors will give me a power supply with an output of about 500 volts at 200 mils; 25 volts at around 100 mils and about 75 volts at 15 mils. This supply should operate on 12 to 14 volts. Anyone making such a toroid?"

Yes. Try *B&W*'s model TT120W for $15.25. Its outputs are close to what you need.

32S1 Two-Tone Test—"I'd like to be able to two-tone test my 32S1. Any information been printed on this?"

Yes. See W4MXL's article in November 1959 QST (page 54)—*good!*

6 Meter Final—"How about giving me the

alues for a final pi tuning network for 6 meters 'hich I plan to use with a 6146. If I can, I plan ɔ switch this into an already existing final."

See fig. 2 for a 6 meter circuit that is close to ıe one I'm working on in the conversion of the)X40 for 6 meter operation. You may need to creen neutralize this circuit.

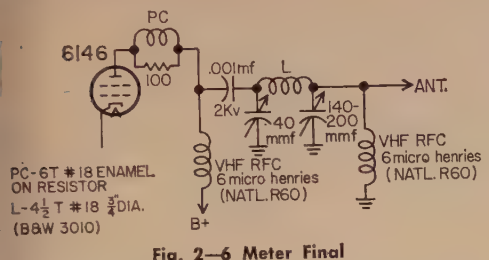


Fig. 2—6 Meter Final

Beam Differences—"I plan to buy a three band ɔeam antenna that uses traps in the element ɛnds. One beam is rated at 300 watts and the ɔther at 1000 watts. Where's the difference?"

#1 weight; #2 size of coils (traps) #3 element length and diameter and #4 boom length. You feed 1000 watts into the 300 watt job and 'sparks will shoot over to Aunt Emma's!" (Same hing happens in a transmitter's final tank when t is too small to take the output power.)

Crystal in a Q Multiplier—"How about replacng the coil in a Q multiplier with a crystal? Will t work?"

G3HQT says it will in the Feb. 1960 of the R.S.G.B. Bulletin. See his fine idea in fig. 3. I

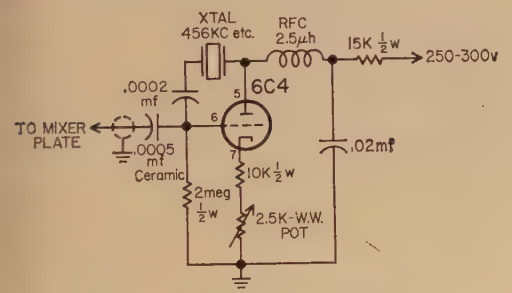


Fig. 3—Crystal in a Q Multiplier

tried it with a 465 *kc* crystal and a 6C4. Works dern good! Remember you still have to re-peak the *if*. The insertion loss is *smaller* than you might think.

Tech Twists—Hits And Bits

. . . F7GZ told me over the air that he installed a small fan in his SB10 to cut down the heat.

. . . *Sylvania* is coming out with CRTs requiring only 1.5 volts at 140 mils for their filaments. (Wish they made a 1" tube—could use one for my transistorized scope!)

. . . *Raytheon* is making a voltage regulated power transformer which is ideal for receivers. This will be good news to the old receiver owners who want better SSB reception through voltage stabilization. The price of the PF110 which puts out 385 *vdc* at 110 mils is around $15.00. Filament voltages are also provided.

. . . The largest radio direction finder installation in the world is located near Urbana, Illinois. It was installed by the University of Illinois in cooperation with FTL under Navy sponsorship. The installation requires 40 acres. What an *antenna* (s)!

. . . France has required, since April 1, that all automobiles, trucks, etc., be equipped with ignition noise suppression equipment! This was aimed at reducing ignition caused *tvi*, but it will also help the other radio services—especially the hams on 10 and 15 meters! Vive la belle France!

. . . If you have an old call-book around and would like to donate it to a worthy overseas ham, send your QTH (not the books) to Clif Evans (K6BX) Box 385 Bonita, California. He will send you the name of someone who has expressed a desire to receive one. Clif is another ham trying to help increase international goodwill and friendship. A big 75 to you Clif!

. . . Know what a hemostat is? Well, doctors use it for clamping off blood vessels during operations. When they slip they are usually discarded by hospitals. Contact your local hospital; they either may give them to you or charge you about $2.00 for a pair. What does a ham use them for? Well, there are many uses for them around the hamshack, i.e., holding resistor ends while soldering (they carry off the heat); putting screws in tight places; fishing out nuts and bolts from chassis corners; holding two wires while you solder them together, and numerous other uses. New, a good hemostat sells for about $20.00 because they are made of the finest surgical steel. A little work with the file will make them hold as they did before.

Thirty

It is always difficult for me to "sign off" because there is usually much more to write about, but space does not permit it. I still do not have a name for the scope book so it looks like HAM SCOPE BOOK it is (unless the publisher decides differently). Getting the material together is a lot of hard work and requires a lot of time (in between answering large batches of letters from you good readers). But it will be coming. I hope you'll get a copy.

When you write in, again I remind you to use airmail and enclose a self-addressed stamped envelope (AIRMAIL) for faster service. If there *seems* to be a long lapse of time between your writing and receiving an answer, remember that I try to do my best! Every week's mail is loaded with hundreds of letters—remember: you don't have to be a subscriber to *CQ* to use *HAM CLINIC'S* information service . . . but gosh, it is better to be a subscriber because YOU DO save money.

So for this wonderful month of May, 73 and 75 to all of you who give me the ideas you read in the column—72 to my overseas friends!

Chuck, W6QLV/F7FE

SURPLUS

by KENNETH B. GRAYSON, W2HDN
Care of CQ 300 West 43rd Street, N. Y. C. 36, N. Y.

When we received the big crate containing the AN/TRC-8 receiver, we had to get some husky help to move it into the shack. It turned out to be a lot smaller than we first thought and well worth the almost thirty dollars it cost. Actually the equipment we have is the R-48/TRC-8 receiver which is a basic component of the AN/TRC-8 equipment. This equipment is designed to operate on the 230 to 250 *mc* band and is FM.

The receiver has many nice features, including a self contained 110 volt *ac* power supply which saves a lot of work in conversions. Also incorporated in the equipment is a squelch circuit and a meter for tuning all circuits. Figure 1 is the schematic of the equipment. Note that there is a power take-off plug on the front panel which can be used to an advantage in conjunction with preamplifiers of the low noise type, or for test oscillators, or any other circuit which may need power. Although we couldn't get hold of the instruction book, the schematic inside the shipping case supplied enough information to make the conversion.

There are two possible conversions that we decided upon. This month we will cover the conversion to 220 *mc* amateur use and to AM. Next month the conversion will continue to make a good two meter receiver out of the TRC-8.

The *if* of the receiver is about 28.1 *mc*. Selectivity isn't as good as we would like it to be, since for the original purpose (FM) the bandwidth definitely had to be broad. We found that we could improve the bandwidth by removing the loading resistors across the *if* coils. These are resistors R18, R24, R28, R39, R99 and R100. The latter two resistors are in the last *if* can. While you have the *if* shield off you can remove C69 if it is located within the can. Some models apparently have this within the can while others have it outside.

The next step is to rework the detector into one for AM. Figure 2a shows the schematic of such a detector, while fig. 2b shows the parts layout using the terminal board adjacent to the detector, V-10 (6AL5). You will be able to see that a noise limiter is incorporated into the detector, greatly helping reception.

Access to this circuitry is obtained by the removal of the bottom plate and then setting the receiver on its back, face up. The removal of the shield plate at the right of the receiver will expose the detector circuits. It isn't necessary to remove the screws completely to take the shiel out, just loosen them.

Testing

The receiver should be tested after the de tector has been wired in. This is best accom plished by using a signal generator or a gri dipper for a signal source. If a signal generato that doesn't cover the frequency range is a that is available, use the 23 to 25 *mc* portio of the sig gen and put a small diode between th center of the coax connector and the signa generator hot lead. This is to increase the ha monic content in the output.

It may be desirable to change the coax cor nector on the front panel of the receiver to on of the more popular amateur types, although th type N connector employed is very fine an well chosen to provide a constant impedanc match. The UHF (SO-239) type is directly i terchangeable as far as size is concerned.

Realignment

The realignment to the 220 *mc* band is ver simple. Connect the signal generator to the re ceiver, with the diode as mentioned before, an set to 21.8 *mc*. Turn the dial of the receive to about 230 *mc*. Now, carefully adjust th trimmer of the oscillator (on the top side of th receiver) until you hear the tone in the speaker Make sure that you have the volume control a the way up. You may also find it handy to pu the meter switch on the "1st LIM Ig" position This measures the grid current of the first limiter which is directly related to the signal strength Any indication will show that the signal is get ting through. The meter should be peaked, a this setting, by adjusting the mixer trimmer and then the *rf* trimmer, for maximum readings It should be necessary to check the trimme adjustments as often as two or three times, s as to make sure the alignment is perfect, sinc there is always a possibility of oscillator pulling which can be held to a minimum. The receive is now adjusted to 218 *mc*. Now set the sig ger to 22.6 *mc*, which corresponds to 226 *mc*, an see where that comes in on the dial (of th receiver). The same technique can be used t calibrate the dial. The dial is made of white plastic which is bonded between two sheets o black plastic, so that the white letters on black background can be obtained after engraving By removing the dial cover, the dial will be

[*Continued on page 104*]

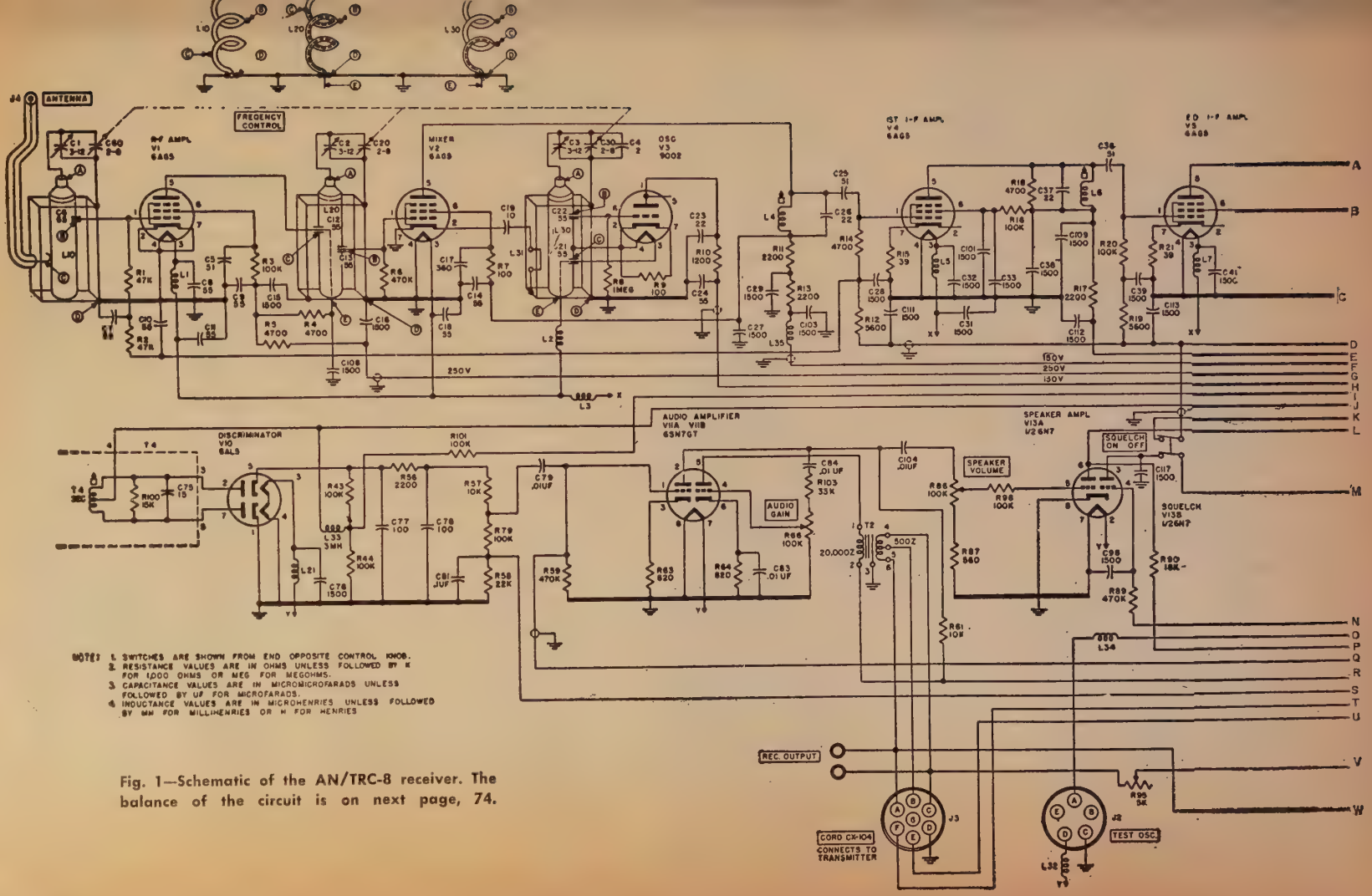


Fig. 1—Schematic of the AN/TRC-8 receiver. The balance of the circuit is on next page, 74.

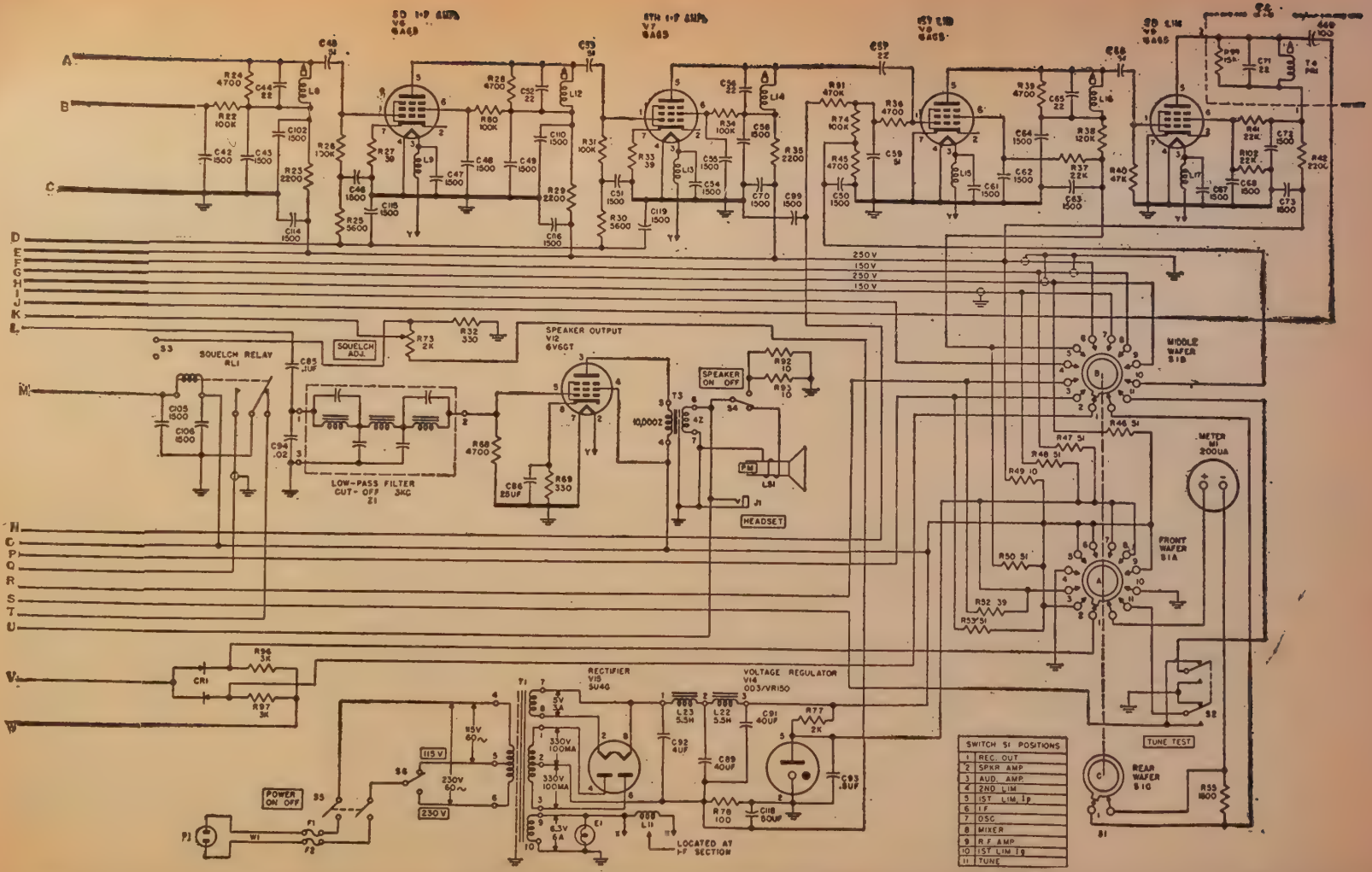
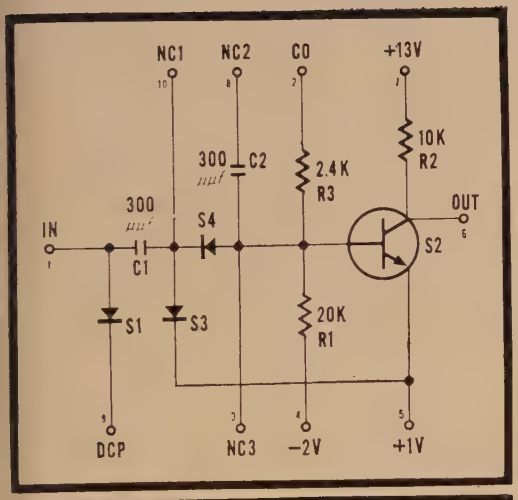


Fig. 1—Circuit continued from page 73



by DONALD L. STONER, W6TNS
P.O. Box 137, Ontario, Calif.

semiconductors



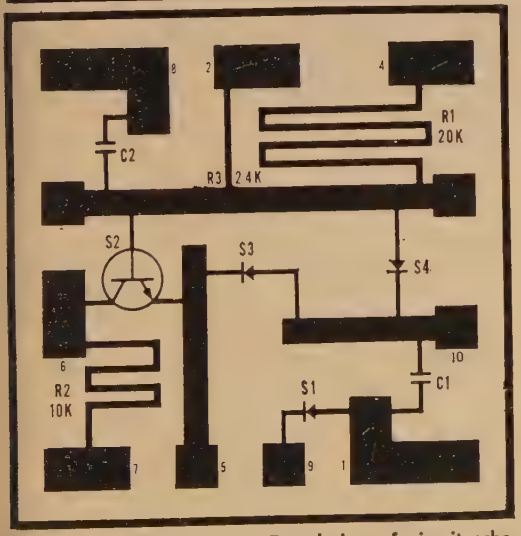




Fig. 1—Translation of circuit schematic to microcircuit working negative. Top—ARMA microcircuit, type SF-1. Center—CBS Electronics microcircuit layout. Bottom—Working negative for type SF-1 circuit.

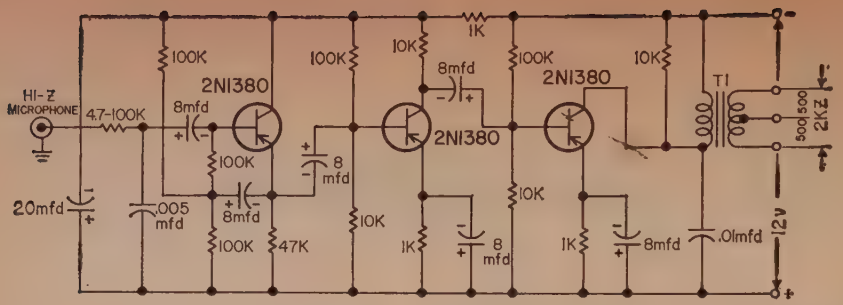
If the state of the miniaturization art progresses much further we will have to coin a new word—*microhamshacks!* Every day the mail and magazines bring information on new microminiature components and circuits. The word *subminiature* has long since been obsoleted by the microcomponents and microcircuits.

For example the other day I was experimenting with some *Pacific Semiconductors Microdiodes.* These tiny semiconductors can only be described as a "flyspeck on a wire". Suddenly one slipped off the workbench and it required almost an hour of searching on my hands and knees to find the little bugger. It was standing upright in the nap of the rug, which made it practically invisible.

Another amazing advance is the *Texas Instruments* microcircuits. All the components, both active and passive, are made from a solid piece of silicon. The multivibrator I saw was not much larger than the head of a match!

Microelectronics—Microelectronics is a term that has been coined to describe the field of microminiaturized electronics circuitry. The missile and space programs have brought about a considerable advancement over the conventional printed circuit, particularly in package size and reliability. Typical microelectronic circuits comprise both active components (transistors and diodes) and passive elements (resistors and capacitors), as well as their associated interconnections and terminals. Circuit package densities of hundreds of thousands of components per cubic foot can be achieved using microelectronic fabrication techniques.

CBS Electronics has been doing considerable work on microelectronic circuits, particularly in the field of computers. Computers must carry out hundreds of thousands of interrelated math computations, which require a tremendous array of complex circuits. The ground based computers, used in the defense system, are huge. They require large buildings to house them, space-consuming generators to supply power and elaborate blower systems to cool them. Miniaturization has succeeded in reducing the bulk of such computers. They must be further



T1—10K to 2K c.t. interstage transformer (Triad TY-56X or equiv) Transistors—3 2N1380 (TI)

Etched circuit board and three transistors available from: Semiconductors 'n' Stuff, Box 288, Alta Loma, California (cost—$5.00 postpaid).

Fig. 2—Hi input impedance speech amplifier. Note that plus and minus are common, allowing the speech amplifier to be used with positive or negative ground automotive systems.

reduced for airborne applications.

CBS Electronics microelectronic circuits employ vitreous or ceramic substrates, with conducting paths fabricated by chemical plating, evaporation and photographic techniques.

Figure 1 (top) shows the schematic for a typical computer circuit. Once the circuit values are known the next step is to produce a microcircuit layout drawing as shown in center. Finally a working negative is made actual size for the microcircuit. The photograph on page 77 shows what a typical finished microcircuit might look like.

In the future, amateurs will be experimenting with microreceivers and microtransmitters. Let's hope we don't have to use them on *microhambands!*

Speech Amplifier

Transistors have a low input impedance (500 ohms to 2k) when connected in the common emitter configuration. A crystal or hi Z dynamic microphone connected to such a circuit would be heavily loaded, producing a loss of low frequencies.

One simple solution is to connect a matching transformer of 100 K to 2K impedance between the microphone and the amplifier input. Such transformers are expensive, however, and occupy unnecessary space.

A simple solution to the dilemma is shown in fig. 2, a transistorized speech amplifier designed by Lester Earnshaw, ZL1AAX. In this circuit several tricks are used to raise the input impedance to obtain the proper impedance match.

Most important, the input transistor (a 2N1380) is connected in the common collector configuration. Actually the stage is an emitter follower and functions much the same as a vacuum tube cathode follower. It also exhibits the same characteristic of raising the input impedance due to heavy degeneration. Additional degeneration is provided by an RC feedback circuit connected between the base and emitter.

An additional step to raise the input impedance is to connect a resistor in series with the microphone. Although this does drop the gain slightly, the resistor may be adjusted to equalize the frequency response and is set for the most pleasing audio quality.

The emitter follower drives a two stage common emitter amplifier to raise the audio to useable level. An impedance matching transformer across the output allows the speech amplifier to drive a single ended class A stage, a push-pull class B stage, an audio phase-shift network or a diode balanced modulator. The speech amplifier will deliver 0.7 volts to a 500 ohm resistor connected across one half of the secondary winding, when driven by a dynamic microphone (—54 *db*).

For maximum stability each stage employs emitter degeneration and the amplifier is not heat sensitive. The 1K—20 mf filter network eliminates any tendency toward motorboating even with weak batteries.

The 10K resistor loading the primary of the transformer helps present a constant load to the output transistor when driving an audio phase-shift network or Class B stage. You can experiment with this resistor to see if it is necessary in your application.

Volume Control Circuits

The speech amplifier just described has more gain than is necessary for most applications and presents an excellent opportunity to discuss transistor volume control circuits.

Figure 3 shows three ways the volume control could be connected in the base circuit of the output transistor. In circuit (a), the volume control element replaces the 10K base bias resistor and the base of the output transistor is connected to the arm. This circuit is not satisfactory, for the potentiometer acts as a voltage divider for the transistor bias. At any point lower than "wide open" the transistor will not have adequate bias and distortion will be very evident. This connection also causes the output impedance to vary widely.

The circuit configuration (b) is not too satis-

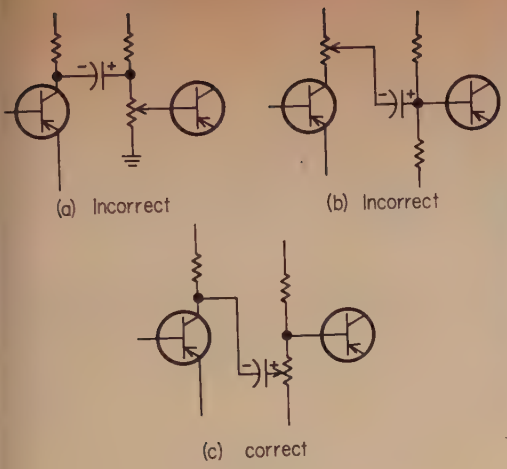


Fig. 3—Volume control circuits

factory either. Here the volume control replaces the collector load of the second transistor and the capacitor is connected to the arm. It is conceivable that the output stage would amplify crud on the power supply line at low volume control settings. However, the main disadvantage of this circuit is the fact that the volume control tends to get noisy after a while due to current flow through the element.

Configuration (c) should be used. Here the potentiometer is connected in place of the 10K base bias resistor in the output stage. However, this circuit differs from (a) in that the coupling capacitor is connected to the arm. The base current is only a few micro-amperes and will not damage the volume control. Even this circuit has a disadvantage, however. At a very low setting, the volume network acts like a differentiator and knocks off some of the lows. In operation this seldom is troublesome since the volume control is usually ½ to ¼ open anyway.

Semiconductor News

Semiconductor News is a little slow this month. Everyone is saving their "goodies" for the IRE show in New York. Standby for action next month though!

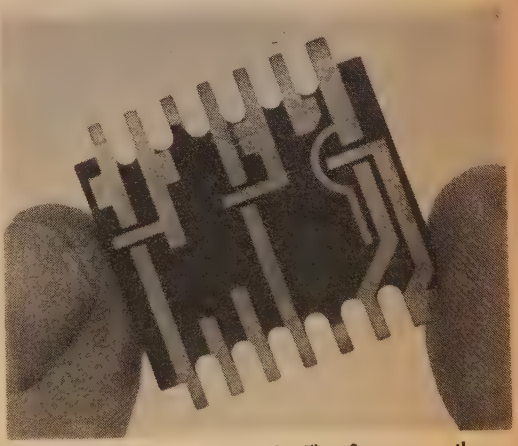
Bendix Red Bank, Long Branch, New Jersey —A new line of stud-mount rectifiers meeting "mil-speks" just announced, types 1N1614, 15, and 16, with PIV's between 200 and 600 volts and rated to 10 amperes.

General Electric, Semiconductor Products Dept., Syracuse 1, N. Y.—Price reductions ranging from 28% to 61% on GE's line of military rectifiers.

International Rectifier Corporation, El Segundo, Calif.—Silicon rectifier stacks are the big news this month. These devices are "pre-engineered" with built in reactors to insure equal current distribution through circuit branches. Bulletin SR-335 describes these units. Also new



It had to happen! Too late for inclusion in the column, word was received on the *Pacific Semiconductors* "Micro-Transistor" and the "Ultra Micro-Transistors" shown here. A single granule of salt is shown (white dot lower left) for size comparison. The larger transistor measures 0.14" X 0.085" X 0.035" and is encapsulated. For ultra compact computers, the "basic" transistor is also available. Shown in the upper right, this is undoubtedly the world's smallest transistor (1/2000 the size of a TO.5 package, and roughly the size of a granule of salt!) Several million of these transistors can be packed into a cubc foot of space. Both transistors are electrically the same as the PSI 2N1409-2N1410 family, with power dissipation commensurate with their size.



CBS Electronics microcircuit. The fingers on the card plug into associated circuitry. This card contains all the active and passive components.

is a series of 125 JEDEC silicon medium power stacks with spans between 1.5 and 14.4 amperes at 31 to 1500 volts. Bulletin SR-330 describes. If you don't have a copy of International's new *Zener Diode Handbook*—get a copy—it's terrific! Also terrific is International's house organ, *Rectifier News*. You can get on the mailing list by requesting it on your company letter head.

Philco Corporation, Semiconductor Div., Lansdale, Pa.—The new Philco 2N1158 looks like it might be a low-cost item. This PNP Germanium is designed for local oscillator service

[*Continued on page 106*]

by DONALD L. STONER, W6TN
P.O. Box 137, Ontario, Cali



Novice

I would like to see every Novice construct his first transmitter right from "scratch" by following the plans presented in CQ, QST and the various handbooks. It certainly doesn't take much effort to whip up a power supply and convert an ARC-5 to 80 or 40 meters.

But, let's face it; not everyone has the time for such a project. Under these circumstances the next best thing is to construct a kit. This can be a valuable and gratifying experience, particularly if you don't simply go through the mechanical motions of assembling the unit. Try to follow your movements on the schematic in order to understand *why* you are doing the particular step.

Every so often, when a meritorious kit appears on the market, it is discussed in this column. Such a unit is the *Globe Electronics Chief Delux*. Basically the "Chief" is a CW transmitter running 75-90 watts on the 80 through 10 meter bands. It is packaged in a neat looking grey cabinet with modern lines, and measures 6¼" high, 11" deep and 15¼" wide. The "Chief" weighs in at approximately 22 pounds.

Lower your eyeballs to the schematic (fig. 1) for a moment, and we'll see how the "Chief" produces such a powerful "warwhoop". The ri is just about as straightforward as you're likel to find. The reliable team of a 6AG7 (oscillator buffer) driving a *pair* of 807's (final amplifier in parallel is used. A heavy duty 5U4 power the *rf* circuits. Globe engineers spent many late night trying to provide extra features o the "Chief". They have provided accessory sockets on the rear apron for about everything a ham could desire, with the possible exceptio of a push button transmission!

Oscillator — By properly connecting socke *SO-6*, the 6AG7 may be used as a crystal con use with an external *vfo*. For crystal control, the trolled oscillator buffer or a buffer-amplifier fo cathode of V1 (6AG7) is ungrounded, allowing the tube to function as a modified Pierce oscil lator. Oscillations in the grid-cathode circuit are amplified by the tube and appear in the plate circuit through electron stream coupling. The suppressor and screen of this "jug" provides ex cellent isolation and the plate circuit (L1, L2 and C5) does not "pull" the crystal more than a few hundred cycles. The plate circuit is reso

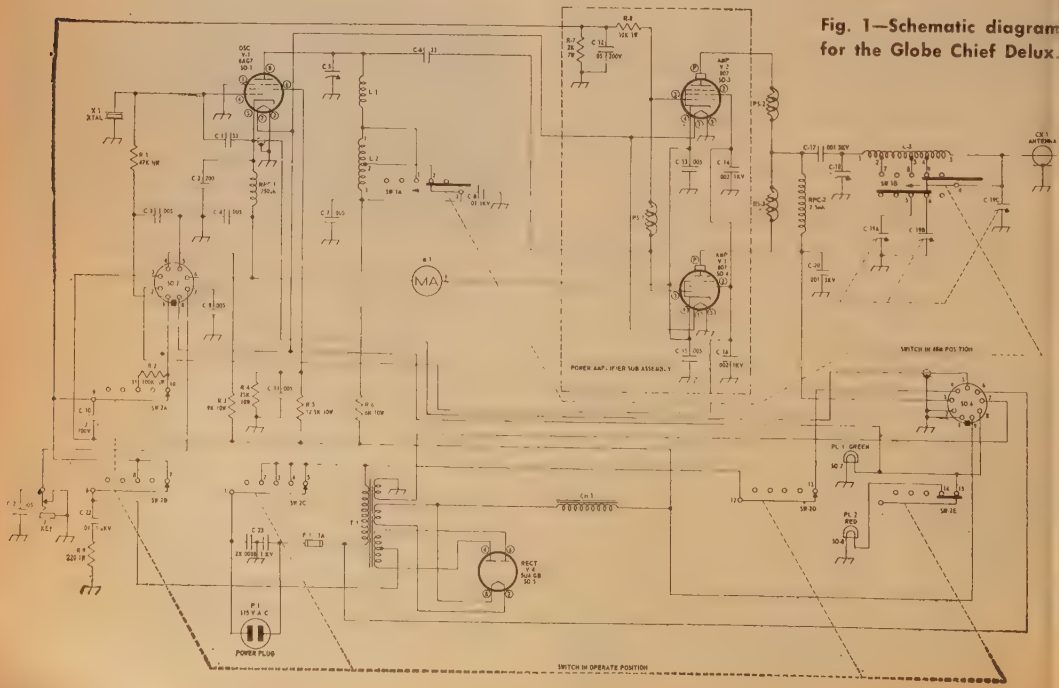


Fig. 1—Schematic diagram for the Globe Chief Delux

ıated at the crystal frequency on 80 and 40, :uned to the second harmonic of a 7 *mc* "rock" ɔn 20 meters and to the third harmonic on 15 meters. On the 10 meter band, the second harmonic of a 40 meter crystal is used (14 *mc*) and the final doubles the driving frequency.

For *vfo* operation the cathode of V1 is shorted to ground. This converts the tube to a conventional amplifier and buffer which increases the *vfo* energy and increases the isolation between the *vfo* and final.

Amplifier—Rf from the oscillator is coupled to the control grids of the final amplifier through C6 and PS-1. Although only one 807 could be pushed to the rated power output, Globe uses two in parallel for an extra safety margin.

The final delivers power to the antenna through a pi-network system, designed to match non-reactive antenna systems between 50 and 600 ohms. The final operates straight through on all bands except 10 meters.

Power Supply—The power transformer is a husky brute and should stand rough treatment during contests, and the like. The transformer accounts for more than half the weight of the unit!

Keying—As mentioned earlier, the accessory sockets provide for many circuit changes. As an example, you can change from keying the cathodes of the oscillator and final to grid-block keying simply by rearranging the connections to the plug for *SO-2*. This socket is also used for the *vfo* input jack.

Accessory socket *SO-6* can be wired to accept a Globe screen modulator or a home brew, high level plate modulator. Socket *SO-6* also provides the necessary connections for an antenna relay. All these changes can be made without even removing the transmitter from the case!

Building the Kit—The construction of the Chief Delux is simplicity itself .You should be able to polish it off in 20 or 30 hours of spare time. The manual is well written ,however, no voltage data or resistance chart is given (should troubleshooting ever become necessary).

Testing—Your conductor thought he had "goofed" when it came to testing the transmitter. As soon as the plate power was applied—whoosh—out went the line fuse. I spent over an hour checking the circuit and components. After eliminating everything, I checked the fuse. Some joker had slipped me a *1 amp* fuse in place of the *3 amp* called for in the parts list!

On the air, the Chief Delux proved to have a powerful "warwhoop" and an extremely clean teepee! The note was loud and clean, and none of the stations contacted reported any poor keying characteristics.

Loaded to 75 watts (180 *ma* plate current), the power output measured 47 watts on 80 and 40, 43 watts on 20, 40 watts on 15 and 36 watts on 10 meters. When loaded to the full 90 watts power input, the output was corresponding higher.

The Chief Delux looks mighty good here on the desk. I think you will be proud to construct and operate it too!

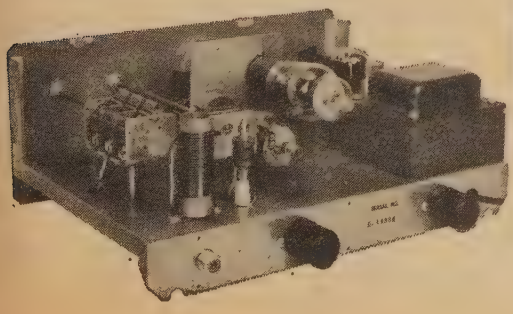
Who's DX?

The 15 meter band was pretty good into Europe about the middle of February and our friend Tima Popovic, YU1-RS-357, Banta Novo Selo, Yugoslavia, logged quite a few stations. Here's his report. As always, the times are in GMT and the band is 15 meters unless noted otherwise.

Feb. 14, 1623-1921; KN1KAV, KBV, KCA, KHE, KSA, KTM, KYI, KZL, LAD, LFG, LLQ, LLU, LOM, LPX, LWH, LWZ, MFA, MKP, MNH, MPM, MSD, NDA, NED, WV2ETF, FHU, FPW, FMS, FNA, FUT, GFX, GGB, GQA, GUB, GXM, GXP, HMS, HRW, IFY, IKS, JLU, JUH, JZF, KBX, KHV, KKG, MWT, ZXM, KN3IWK, JIK, JLI, KHK, KLI, KLN, KLO, KUM, KN4FOT, FSA, GWI, HAJ, HRZ, ION, KUK, OVS, PGR, PVD, QDP, QZY, RDJ, RNO, SHB, KN5ZCL, KN8FLY, OCN/4, OES, OGH, OPZ, OUX, OYN, QXB, RDE, RZL, KN9UDC, UTM, VEZ, KNØTXT, VDY, WNV. Feb. 15, 1652-1910; KN-KPS, LPT, LUJ, LUX, MNP, WV2FMZ, HMR, HZT, IAN, JBG, JRM, KN3KLN, KLS, KQA, SUT, KN4GKP, HJJ, JWQ, LHH, LNP, MPE, MUK, PZR, QDR, QLY, QMH, RDJ, RPJ, KN8RFZ/8, RHK, KN9RQK, TAX. Feb. 17, 1714-1929; KN1DVA, KHC, LEV, MSB, MYN, WV2FVE, FYE, GKH, HVO, IJS, JDT, KN3JJG, KN4ETU, FUJ, GLU, ONB, ORD, PPY, QIP, KN5YQJ, WV6HSF, KN9VEP, KNØTHU, VGN.

Thanks, as always, Tima for your FB report.

Rear view of the Chief. The black "knobs" on the rear apron are adapter plugs for switching circuit functions. Note the large size power transformer.



Introducing the new Globe Electronics Chief Delux 90 watt cw transmitter. The Chief may be easily adapted for General class operation (phone-vfo) simply by changing the plugs on the rear apron.



Our reporter in Japan, Larry Manson, WA6BKQ/KA2, reports hearing a few stations at his QTH in February. They are:

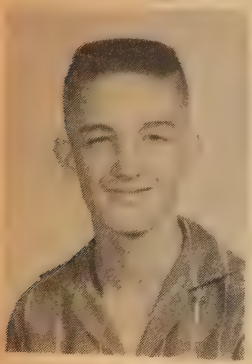
Feb. 17, 2030; KN5 VZF. Feb. 18, 2045; WV6ILP. Feb. 21, 0045; WV6IEA, WL7DID. Feb. 22, 0135; WV6IQY. Feb. 27, 0125-0200; WV6IQA, FJD, WV2GBR (yep—WV2!), Feb. 28, 0240; WV6FKH, GIY. By the way fellows, Larry has a batch of SWL cards and will be happy to confirm reception of these stations if they will send a SASE and QSL. His address was in this column last month.

From that same end of the world, Tom, KR6ZT, Okinawa's only Novice, writes to report reception of the following stations: Feb. 5, 2230-2300; WV6GNC, IEA, IQY, IVM, KNØYMT. Feb. 7, 0030-0400; KN5VQR, WL7DHK, DIK, WV6GNC, GWT, HYR, ICG, IQY, IRL, IVP, KN7IFG, KN8FTM, IKG. Feb. 14, 0030-0330; WV6FJD (called many times—589—no answer), GVP, HSF (YL!), IQY (does this guy ever sleep?).

Tom sure has problems! He has 49 countries worked, but only 9 states! Wouldn't we all like that problem— hi. Also many stations that Tom calls actually hear him (they couldn't help) but don't answer because they think he is just another *six*—Listen carefully men, that's KR6, not K6!

Gerry Smillie, G-8263, Officers Mess, RAF Wyton, Hunts, England, has been off trooping around the world again but did manage to log the following stations; Feb. 6, 1335-1430; WV2FMT, KN4RNO. Feb. 27, 1333-1833; KN1MKB, WV2ELS, FUU, GRE, HVR, KN3JZV, KLN, KN4LHM, ONT, PLR, KN5ZMU, ZRQ, KN8NXA, QBM, KN9RNQ, and WP4AUL. Gerry is putting up a new vertical so the list of calls should be pretty long next month—assuming he doesn't have to fly off to the Maldives or some other exotic country!

John J. Evans, K4CIC/CN8, 4th Radio Relay Sq., APO 118, Box 447, New York, N. Y., writes to tell the readers of stations heard in Rabat, Morocco. The armed forces CN8 licenses were not issued after Feb. 1959, so many of the hams over there have to be content with just listening to the band. The following stations were heard on Feb. 25, 0001-0040 on 40 CW: KN1LXA, MGK, NEA, WV2FVD, GQC, KN3OGJ, KN4LAC, OZG, SFK, KN8QVV, RPA, KN9RNQ, TYG. The RST's ranged from 469 to 589. Many thanks to you John. The Novices sure appreciate hearing that their sigs are getting out.



Meet Larry Lloyd, KNØVMZ, Winona, Mo. No wonder Larry looks pleased—he just snagged WAS.



John Black, K4JNO, Baylor Military Academy, looks like he can really throw that "Bug" around. because of crowded conditions in the dorm, John is going to do some fishing when the weather warms up a bit!

Net News

We haven't had too much information for this department lately, but John Bohnovic, K8PXG and Bill Klima, KN8RYJ, took the time to write and say they are starting a Novice CW net on 21.150 and would like to meet at 2030 EST on Mon. and Wednesday. For further information, write K8PXG or call him in Cleveland at SW 1-8141.

Help Wanted

Looks as if everyone who wants to become a ham is working on it. Pickin's are pretty slim this month! If you would like to help with either your Novice or General, drop a letter or postal card to the address at the head of the column. There most certainly is no charge!

WZ—Brendan Duffe, 93 Michael St., Iselin, N. J. (LI 9-2461).

W7—Jeffrey A. Rounce, 121 7th Ave., SW, Sidney, Montana.

Baker Hardin, Jr., 2704 N. Tyndall, Tucson, Arizona.

WL7—Frank Knapp—You forgot your address, Frank!

W9—Wallace Scott, 111 Jones Rd., Norwood Pk., Peoria, Ill.

Letters

Leading off is Richard Duell, RD #3, Coudersport, Pa., who operates amateur station KN3IWT. Dick has been on the air for 102 days and now has WAS, WAC, WAZ-22, DXCC-32 and 238 QSO's. The "not much" DX list was too long to print, but included MI3, CEØ, KS4,

[*Continued on page 108*]

PROPAGATION

George Jacobs, W3ASK
607 Beacon Road, Silver Springs, Md.

Last Minute Forecast

Normal high frequency propagation conditions are expected during the entire month of May except the period 11-13 which is likely to be moderately disturbed, and the period 23-26 which is expected to be above average.

The Editor Speaks

This past March marked the beginning of my tenth year as Propagation Editor for *CQ* Magazine. During the past nine years I have watched, with a very rewarding satisfaction, this column rise to become one of the "most read" in the magazine. I don't believe, however, in resting on past laurels. Based on my personal analysis of several hundred letters received during the past two years I feel that some improvement can be made to make the column of even greater use and interest to a much larger number of readers.

After several months of mental experimentation, and the solicited opinions of many amateurs, a "new look" is introduced in this month's column.

The New Look

Beginning with this month's column the DX Propagation Charts have been expanded to nearly 1½ times their previous content. From each of three main geographical areas in the United States, predictions are now given to 14 different key areas throughout the world, including some of the choicest DX locations. To further improve the utility and accuracy of the Charts, some revisions have also been made in the points within the USA upon which the Charts are centered. The Eastern USA Chart, centered on Washington, D.C. is intended for use in the following Districts:

W1, 2, 3, 4, and 8.

The Central USA Chart, now centered on Denver, Colorado, is intended for:

W 5, W 9, and W Ø.

The Western USA Chart, centered on Sacramento, California, is intended for:

W 6 and W 7.

This revision permits the DX Charts to be used throughout the entire continental limits of the country with greater accuracy than was possible previously.

But not all readers of this column are interested solely in DX propagation conditions. If mail can be taken as an accurate indication, far better than half the readers, a good number of whom are Novices, are just as eagerly interested in knowing when 40 meters might open to that "rare" state several hundred miles away as the DX'er is in knowing when his chances are best for working his 200th country. For these readers, a greatly expanded Short-Skip Propagation Chart has been devised. This chart will contain forecasts for all bands between 6 and 160-meters, for distances up to about 2400 miles. The Short-Skip Chart will also include data for the new states of Hawaii and Alaska.

Between both the DX and the Short-Skip Propagation Charts, the high frequency propagation prediction needs of all amateurs should be satisfied. Unfortunately, however, the great amount of work necessary to devise both series of Charts, and the large amount of space required to print them, precludes their appearing *every* month. Instead, each Chart will appear on *alternate* months, and will be valid for a *two month* period. For example, the DX Chart for May and June, 1960 appears in this month's column. Next month, the Short-Skip Chart for June and July will appear, to be followed in July by a DX Chart for July and August, etc.

By interpreting the basic propagation data used for these forecasts in a somewhat different manner than previously, it is believed that the two-month period forecasts will be as accurate as the monthly forecasts have been in the past.

The indices shown in the Charts next to the times of openings are *probability* figures indicating the total number of days the circuit is expected to open during each month of the forecast period. The index (1) shows that the circuit is expected to open on less than 5 days during each month; (2) openings are expected between 5 and 11 days; (3) between 12 and 22 days, and

MAY-JUNE, 1960

TIME ZONE: EST

EASTERN USA TO:

	10 Meters	15 Meters	20 Meters	40/80** Meters
Western Europe	3P-6P (1)	8A-12N (1) 12N-4P (2) 4P-7P (3) 7P-9P (2)	2P-4P (1) 4P-6P (3) 6P-9P (4) 9P-11P (3) 11P-4A (1) 4A-8A (2)	7P-9P (1) 9P-12M (3) 12M-2A (2) 9P-12M (1)**
Eastern Europe	NIL	10A-2P (1) 2P-5P (2) 5P-6P (1)	7P-12M (1)	NIL
North Africa	4P-7P (1)	7A-11A (1) 11A-2P (2) 2P-5P (3) 5P-7P (4) 7P-9P (2) 9P-10P (1)	1P-4P (1) 4P-6P (2) 6P-8P (3) 8P-9P (4) 9P-11P (3) 11P-3A (1) 3A-7A (2)	7P-9P (1) 9P-12M (2) 12M-2A (2) 10P-1A (1)**
Eastern Mediterranean	NIL	11A-2P (1) 2P-4P (2) 4P-6P (3) 6P-8P (2)	2P-5P (1) 5P-7P (2) 7P-9P (3) 9P-12M (2)	7P-11P (1)
Central Asia	NIL	2P-4P (1) 4P-7P (2) 7P-9P (1)	9P-11P (1) 6A-8A (2) 8A-9A (1)	NIL
Southeast Asia	NIL	1P-5P (1) 5P-7P (2) 7P-9P (1)	10P-12M (1) 6A-8A (2) 8A-9A (1)	NIL
South Africa	9A-11A (1) 11A-3P (2)	12N-2P (1) 2P-5P (2) 1A-3A (1)	3P-5P (1) 5P-7P (2) 7P-10P (1) 1A-3A (2)	8P-11P (1) 9P-11P (1)**
South America	7A-10A (2) 10A-2P (3) 2P-6P (4) 6P-10P (2) 10P-1A (1)	6A-10A (2) 10A-1P (1) 1P-3P (2) 3P-5P (3) 5P-12M (4) 12M-2A (2) 2A-6A (1)	3P-5P (1) 5P-7P (2) 7P-1A (4) 1A-3A (3) 3A-5A (2) 5A-7A (3) 7A-9A (2)	8P-3A (3) 3A-5A (1) 9P-3A (2)**
Pacific Islands	9A-1P (1) 1P-7P (2) 7P-9P (1)	8A-12N (2) 12N-8P (1) 8P-10P (3) 10P-12M (2) 12M-2A (1)	8P-11P (1) 11P-4A (3) 4A-7A (2) 7A-9A (3) 9A-11A (1)	1A-6A (3) 6A-8A(1) 2A-5A (1)**
Australia	7P-9P (1)	8A-11A (1) 10P-12M (1) 12M-3A (2)	10P-12M (1) 12M-2A (2) 2A-4A (3) 4A-7A (2) 7A-9A (3) 9A-11A (2)	2A-3A (1) 3A-6A (2) 6A-8A (1) 3A-5A (1)**
New Zealand	3P-5P (1) 5P-7P (2) 7P-9P (1)	7P-9P (1) 9P-1A (2) 1A-4A (1)	9P-11P (1) 11P-3A (4) 3A-8A (3) 8A-10A (2)	11A-12M (1) 12M-5A (2) 5A-8A (1) 2A-5A (1)**
Far East	NIL	3P-5P (1) 5P-9P (2)	11P-2A (1) 6A-9A (2)	NIL
McMurdo Sound	1P-2P (1) 2P-4P (2) 4P-5P (1)	1P-3P (1) 3P-4P (2) 4P-7P (3) 7P-9P (1)	4P-6P (1) 6P-9P (2)	9P-2A (1) 2A-4A (2) 4A-6A (1)

TIME ZONES: CST, MST

CENTRAL USA TO:

	10 Meters	15 Meters	20 Meters	40/80** Meters
Western Europe	NIL	10A-2P (1) 2P-5P (2) 5P-8P (1)	4P-8P (1) 8P-12M (2) 12M-6A (1)	8P-12M (1)
Eastern Europe	NIL	10A-1P (1) 1P-3P (2) 3P-5P (1)	4P-8P (1) 8P-12M (2) 12M-5A (1)	NIL
North Africa	3P-6P (1)	8A-11A (1) 11A-2P (2) 2P-6P (3) 6P-8P (2) 8P-9P (1)	1P-3P (1) 3P-5P (2) 5P-7P (3) 7P-10P (4) 10P-12M (2) 12M-6A (1)	8P-12M (2) 9P-11P (1)**
Eastern Mediterranean	NIL	11A-1P (1) 1P-5P (2) 5P-9P (1)	4P-6P (1) 6P-11P (2) 11P-6A (1)	NIL
Central Asia	NIL	11A-2P (1) 2P-7P (2) 7P-10P (1)	8P-12M (1) 6A-9A (1)	NIL
Southeast Asia	NIL	7A-9A (1) 9A-11A (2) 11A-3P (1) 10P-12M (2)	2A-5A (1) 5A-8A (2) 8A-10A (1)	NIL

TIME ZONES: CST, MST ,Cont'd.

CENTRAL USA TO:

	10 Meters	15 Meters	20 Meters	40/80** Meters
Central Africa	4P-7P (2)	6A-12N (1) 12N-3P (2) 3P-5P (3) 5P-7P (4) 7P-8P (3) 8P-9P (2) 9P-11P (1)	2P-4P (1) 4P-6P (2) 6P-8P (3) 8P-10P (4) 10P-12M (3) 12M-3A (1)	8P-11P (1) 9P-10P (1)**
South America	6A-8A (1) 8A-12N (2) 12N-6P (3) 6P-7P (2) 7P-11P (1)	5A-7A (3) 7A-1P (2) 1P-4P (3) 4P-10P (4) 10P-12M (3) 12M-2A (1)	1P-3P (1) 3P-5P (2) 5P-7P (3) 7P-1A (4) 1A-4A (2) 4A-6A (3) 6A-9A (2)	8P-10P (1) 10P-2A (3) 2A-5A (1) 10P-2A (2)**
Pacific Islands	10A-12N (1) 12N-2P (3) 2P-8P (2) 8P-10P (1)	11A-6P (2) 6P-7P (3) 7P-9P (4) 9P-2A (3) 2A-7A (2) 7A-11A (3)	6P-8P (1) 8P-10P (2) 10P-4A (4) 4A-7A (2) 7A-9A (3) 9A-11A (2)	1A-5A (3) 5A-8A (1) 2A-5A (2)**
Australia	3P-5P (1) 5P-8P (2) 8P-10P (1)	3P-5P (2) 5P-9P (1) 9P-11P (3) 11P-3A (2) 3A-7A (1) 7A-10A (2) 10A-12N (1)	9P-11P (1) 11P-1A (2) 1A-4A (4) 4A-7A (3) 7A-9A (4) 9A-11A (2)	1A-6A (3) 6A-8A (1) 2A-6A (1)**
New Zealand	11A-1P (1) 1P-5P (2) 5P-7P (3) 7P-9P (2) 9P-10P (1)	11A-1P (2) 1P-5P (1) 5P-7P (2) 7P-8P (3) 8P-11P (4) 11P-2A (3) 2A-4A (2) 4A-8A (1)	6P-8P (1) 8P-10P (2) 10P-12M (3) 12M-7A (4) 7A-9A (3) 9A-11A (2)	12M-7A (3) 2A-5A (2)**
Far East	6P-11P (1)	7A-9A (2) 9A-2P (1) 2P-7P (2) 7P-9P (3) 9P-12M (2) 12M-1A (1)	11P-1A (1) 1A-6A (2) 6A-8A (3) 8A-10A (2)	NIL
McMurdo Sound	12N-3P (2) 3P-5P (3) 5P-7P (2)	11A-2P (1) 2P-5P (2) 5P-7P (3) 7P-9P (2)	4P-5P (1) 5P-7P (2) 7P-9P (3) 9P-10P (2)	9P-12M (1) 12M-4A (2) 4A-6A (1) 1A-3A (1)**

TIME ZONE: PST

WESTERN USA TO:

Western Europe	NIL	11A-1P (1) 1P-3P (2) 3P-9P (1)	3P-6P (1) 6P-11P (2) 11P-4A (1) 7A-9A (1)	7P-9P (1)
Eastern Europe	NIL	11A-1P (1) 1P-3P (2) 3P-9P (1)	3P-6P (1) 6P-11P (2) 11P-2A (1) 7A-9A (1)	NIL
North Africa	NIL	10A-12N (1) 12N-5P (2) 5P-8P (1)	1P-4P (1) 4P-6P (2) 6P-8P (3) 8P-10P (2) 10P-6A (1)	6P-10P (1)
Eastern Mediterranean	NIL	11A-1P (1) 1P-3P (2) 3P-6P (1) 6P-7P (2) 7P-8P (1)	2P-4P (1) 4P-7P (2) 7P-12M (1) 7A-9A (1)	NIL
Central Asia	NIL	7A-10A (2) 10A-5P (1) 5P-8P (2) 8P-11P (1)	11P-4A (1) 4A-7A (2) 7A-9A (1)	NIL
Southeast Asia	6P-8P (1)	7A-9A (1) 9A-2P (2) 2P-8P (1) 8P-10P (2) 10P-1A (1)	11P-2A (1) 2A-6A (3) 6A-8A (2) 8A-10A (2) 10A-12N (1)	2A-6A (1)
South Africa	11A-1P (1)	11A-12N (1) 12N-3P (2) 10P-12M (1)	2P-4P (1) 4P-6P (2) 6P-9P (1) 9P-11P(2) 11P-1A (1)	6P-10P (1) 7P-9P (1)**
South America		6A-8A (1) 8A-1P (2) 1P-5P (3) 5P-7P (2) 7P-10P (1)	4A-6A (3) 6A-1P (2) 1P-4P (3) 4P-9P (4) 9P-11P (3) 11P-1A (1)	8A-3P (1) 3P-5P (2) 5P-7P (3) 7P-11P (4) 11P-1A (3) 1A-3A (2) 3A-5A (3) 6A-8A (2)	8P-2A (3) 9P-1A (2)**

TIME ZONE: PST, Cont'd.

WESTERN USA TO:

	10 Meters	15 Meters	20 Meters	40/80** Meters
Pacific Islands	10A-1P (3) 1P-6P (2) 6P-8P (1)	7A-9A (2) 9A-11A (3) 11A-6P (2) 6P-1A (3) 1A-4A (2) 4A-7A (1)	5P-7P (1) 7P-9P (2) 9P-11P (3) 11P-4A (4) 4A-7A (2) 7A-9A (3) 9A-11A (2)	12M-6A (3) 1A-5A (2)**
Australia	1P-3P (2) 3P-6P (3) 6P-9P (2)	1P-3P (2) 3P-7P (1) 7P-9P (2) 9P-11P (4) 11P-1A (3) 1A-4A (2) 4A-9A (1)	7P-9P (1) 9P-11P (2) 11P-5A (4) 5A-8A (3) 8A-10A (2)	12M-7A (3) 12M-2A (1)** 2A-5A (2)** 5A-6A (1)**
New Zealand	12N-2P (2) 2P-4P (3) 4P-6P (4) 6P-8P (3) 8P-10P (2)	9A-12N (2) 12N-5P (1) 5P-7P (2) 7P-11P (4) 11P-2A (3) 2A-5A (2) 5A-9A (1)	6P-8P (1) 8P-10P (2) 10P-5A (4) 5A-7A (3) 7A-9A (2)	11P-6A (3) 12M-5A (2)**
Far East	6P-10P (1)	7A-9A (3) 9A-4P (2) 4P-9P (3) 9P-11P (2) 11P-1A (1)	8P-10P (1) 10P-12M (2) 12M-3A (4) 3A-6A (2) 6A-8A (3) 8A-10A (2) 10A-12N (1)	2A-6A (2) 3A-6A (1)**
McMurdo Sound	11A-1P (2) 1P-4P (3) 4P-8P (2)	11A-2P (1) 2P-4P (2) 4P-6P (3) 6P-8P (2)	4P-5P (1) 5P-6P (2) 6P-7P (3) 7P-8P (2) 8P-9P (1)	8P-11P (1) 11P-3A (2) 3A-5A (1) 1A-3A (1)**

FORECAST INDICES

Circuit Forecast To Open:

(1). Less than 5 days during each month, with openings occurring during periods of better than normal propagation conditions.

(2). Between 5 and 11 days during each month.

(3). Between 12 and 22 days during each month.

(4). On more than 22 days during each month.

** Forecast for 80-meter openings. Openings on 160-meters may also occur during this period, when atmospheric noise conditions are quieter than average.

A-A.M. P-P.M. N-Noon M-Midnight

The CQ DX Propagation Charts are based upon a CW radiated power of 150 watts at radiation angles less than thirty degrees, and are centered on the Eastern, Central and Western areas of the USA. The DX Charts are valid through June 30, 1960. These forecasts are based upon basic ionospheric data published by the Central Radio Propagation Laboratory of the National Bureau of Standards, Boulder, Colorado.

(4) on more than 22 days. At the present stage of the propagation art it is not possible to pinpoint the *exact* days of the month on which particular circuits may open. As part of the new look, however, an attempt will be made to take a step towards such a forecast. The probability indices, together with the following *circuit quality* figures and information contained in the "Last Minute Forecast" appearing elsewhere in this column, may make it possible to relate band openings with specific days of the month, at least to some degree.

Table 1

Circuit Quality Figures

A—Excellent circuit, strong steady signals.
B—Good circuit, moderate strong signals, little fading and noise.
C—Fair circuit, weak to moderately strong signals, some noise and fading.
D—Poor circuit, weak signals, considerable fading and high noise level.
E—Circuit out.

The following table gives the relationship expected during May between the probability index, the circuit quality figure and the last minute forecast.

Table 2

Probability Index	Above Normal	Normal
(1)	C	D—E
(2)	B	C—D
(3)	A	B—C
(4)	A	A

Slightly Disturbed	Moderately Disturbed	Severely Disturbed
E	E	E
D	E	E
C—D	D	E
B	C—D	D

This relationship may seem to be somewhat complicated; perhaps an example will clear things up. Table 2 shows that circuits rated with a probability index of (1) should open with fair signals (circuit quality C) during above normal conditions (which, according to the last minute forecast, is expected to be May 23-26). The circuits rated (1) should be poor or out completely during the rest of the month. On the other hand, Table 2 shows that circuits rated (3) should have either good or fair openings during the entire month, except during periods of moderate disturbances (May 11-13), etc. It remains to be seen just how accurate this type of forecast will prove to be.

The DX Charts are based on a *radiated* CW power of 150 watts. Calculations have been made assuming a dipole antenna a half-wave length above ground. A CW power of 150 watts can be assumed to be roughly equivalent to a radiated power of 1,000 watts AM, or 300 watts SSB. For each 6 *db* difference between your radiated power and these references, adjust the probability indices shown in the Charts by 1. Remember, radiated power is equal to the power into an antenna, multiplied by the gain of the antenna over a half-wave dipole a half-wave above ground.

In addition to this new look, each month's column will continue to contain discussions on timely propagation subjects, answers to questions, and explanations of propagation phenomena.

I would appreciate your comments concerning the new presentation of the DX and Short-Skip Charts, and the accuracy you may observe with the new method for attempting to relate openings to specific days.

Solar Cycle

The solar cycle continue to decline at a slow, but steady, rate. The Zurich monthly number for February, 1960 was 104, which results in a 12-month running number of 151 centered on August, 1959. A running number of 120 is predicted for May, 1960.

73, George, W3ASK

VHF

50mc. 144mc. 220mc. 420mc. and above

Sam Harris, W1FZJ
P. O. Box 334 Medfield, Mass.

The Easy Way

I am somewhat disillusioned by the number of inquiries I receive from new hams asking what kind of equipment they should buy to get on the *vhf* bands. In view of the present trend toward commercialism perhaps this is not too surprising. Nevertheless, it would come as a pleasant surprise if someone should ask about the relative merits of an ARRL converter versus a *vhf* handbook converter. Or maybe, should he use triodes or pentodes in his final. I did receive a letter the other day from a new ham asking whether he should buy his rig or build it.

The mere act of going out and buying a ham station certainly cannot be construed as an investment in ham radio. It may be that dollar for dollar you have made a wise choice and, if you purchased wisely, you may get a large percentage of your money back on resale or trade in. Ham radio in general however, is not a good way to save money. It is most certainly not to be considered as a long term financial investment. It *is* a hobby! As a hobby it can afford you with a lifetime of pleasure. Like any other hobby, it has certain degrees of achievement for the newcomer to aspire to.

A first degree ham is one who has the whole world ahead of him. Every move he makes is a first for him. Unfortunately, there is no charted course for him to follow. He is forced to fend for himself in his efforts to become a second degree ham. Sad to relate but nevertheless true, an increasingly large number of hams never find the key to success and are likely to spend the rest of their days as first degree operators.

It is easy enough to define a first degree ham, but how do you tell when he has achieved second degree status? One of the fallacies in the mores of ham radio is that a second degree ham is generally only known to himself. Many people try to pass themselves off as second degree hams by virtue of an all band kilowatt and a commercial all band beam. They may fool you but they can never buy a ticket to the thrilling adventures that the true second degree ham experienced. Who can buy the satisfaction of hearing the first station on a receiver that you built yourself. Or of seeing your first transmitter put power into a light bulb? Or of that first contact with the world of amateur radio using the fruit of your own efforts? You can't buy that kind of ham radio. You have to build it yourself.

So you see the decision to buy or build your first equipment is a matter of deciding whether you want to shortcut the joys of being a new ham because there is an easy way, or whether you are willing to slowly work your way up to the status of Master ham, learning and enjoying as you go.

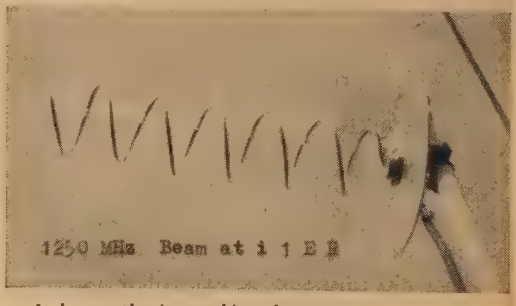
Italy

Any old-timer on the *vhf* bands has heard of Mario Santangeli, I1ER, in Milan, Italy. Mario did outstanding work on the *vhf* bands long before most of us even knew there were such things. His work and experiments have long been mentioned in the amateur publications, and his 5 meter work between Italy and Tripoli made headlines way back in 1926-1927.

In a letter recently received from Mario he has the following to say about the *vhf* bands in Italy:

"As a pioneer in the *vhf* field, I will tell you that here in Italy there are many hams who are active every day on 144 *mc*; a few on 430 *mc*, and nobody on 1250! Of course 50 *mc* is forbidden to amateurs here in Italy."

"In spite of my age, shortly peaking to 62, I am always an enthusiast of the *vhf* bands, but unfortunately my location in town is very poor and my tests are very limited. I1BBB is located in Bergamo, 1350 feet above sea level. He is very active and on the air every day and every night. Another station with a very good location, but not as active, is I1ACT, located on a mountain top, Mt. Penice, 3900 feet above sea level. A total of about 135 amateurs are working



A beam that's working beautifully for Mario, I1ER, on 1250 mc.

on 144 *mc* and the most active are I1BBB, I1FA, I1BSB, I1LOV, I1ALH, I1BZM, I1CWR, I1PC, I1AUV, I1BMP, I1EN, I1GHM, I1MTG, I1QP, I1ZL, I1AY and I1TF."

"As DX records we logged some QSOs between North Africa and the North of Italy in July (15) 1958, and a sporadic QSO between Great Britain and Naples this past year on 144 *mc*."

"I run a sked every evening and each Sunday morning at 0900 GMT with HB9CK, who is located in a hollow place between the Alps, and transmissions are usually effected by reflection of Mt. Rose. Many QSOs are here made in such a way by the Alps or Appenninies and therefore the conditions are often changed by atmospheric conditions influencing those passive reflectors! When snow is on the ground and during the summer conditions are usually very good."

Quite a lot to print from one letter, but I'm sure that all of the American VHFers will think that it is space well-used. We finally have some idea as to what's going on the vhf bands in Italy. Now we'd like to find out about some of the other countries in Europe. Thanks very much Mario for a most interesting letter.

Merano, Italy

Two letters from Italy in one mail bag! Edward, I1CWX sez: "During the European *vhf* Contest, September 5, 1959, I1CWX and I1BLT, were 144 *mc* portable on the top of Mt. Sililaun, 10,000 feet high, right on the border between Italy and Austria. From this excellent location we worked seven countries: I, OE, DL, OK, F, YU, HB. Transmitter—Xtl-QQE 0, 2/5 on A3 5 watt output to 6 over 6 beam. Receiver—Cascode 2X transistor-Super."

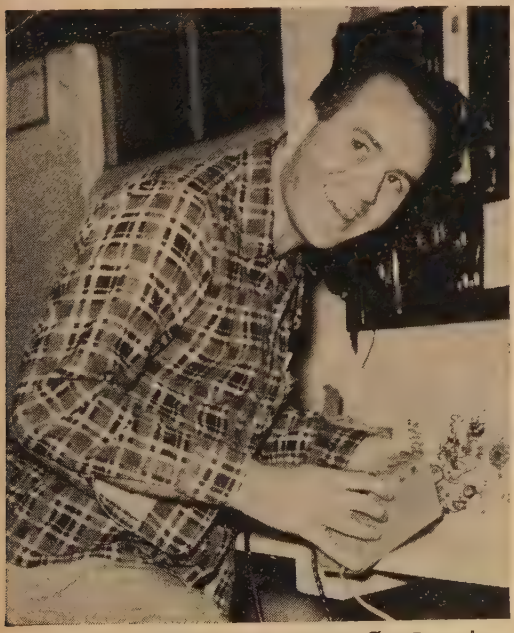
10,000 feet is really getting up there. I'll bet you boys had a few incidents (or accidents) during that contest.

Man of the Month

One of the avid *vhf* contest workers is John Snyder, WØWRT, of Omaha, Nebraska. John writes the following:



The long trek up Mt. Sililaun (10,000) for I1CWX and I1BLT. We know they must mean it when they go that high, and by foot lugging equipment, for VHF contests.



"Man of the Month", John Snyder, WØWRT, surely looks happy while he's working.



From left to right, those same intrepid two on location, I1BLT and I1CWX.

"At the present time, I operate mainly on two and six meters and have also worked just a little bit of 20 meter *ssb*—still nuts about *vhf* primarily. I most generally work the frequency of 144.148 *mc* phone and *cw* and get a kick out of working aurora whenever conditions permit."

"I have fourteen states on two meters and about thirty-five states on six meters, but frankly, I haven't worked very hard at either and haven't been very active just lately since I made a job change."

"Used to work for KMTV television here in Omaha but got tired of TV and took other job with the RCA Service Company doing mobile communications service, etc. Like the work much better. Was with KMTV over seven years."

"Don't run much power here on either band —maximum of 100 watts on two and only 20 watts on six meters, but with good antennas it still works out real *fb*. Antenna for two consists of stacked Telrex wide-spaced 8 element yagis on a 40' tower and on six meters just a 4 element Telrex wide-spaced yagi about 30' high."

"Both rigs and converters are self built and think my six meter job is hard to beat. It consists of the following: 417A in g.g., 6AN4 g.g., 6AK5 pentode mixer with a 6J6 as crystal oscillator, using 40 *mc* overtone rock."

On two I'm using about the same circuit as the Tecraft with some modifications, and could probably do better from a N.F. standpoint but we do have a pretty high power line noise level here, and that is really our limiting factor. Guess the only solution is to move."

Thanks for all the information John, sounds like a very nice set-up.

DX Cards Anyone

Received a letter from DX Editor, Urb Le Jeune, W2DEC, in which he wonders: "If some of your readers who have worked six meter DX might not realize that most foreign hams send all their QSLs via the bureaus? A good many six meter DX cards sit undelivered for the lack of a self addressed stamped envelope."



Ben, W8HXT—Dreaming of "Days Gone By", Ben?

APA 38 Transformer

We understand from W8AET that W8ZM knows where transformers can be purchased for the APA38. If you're interested you might drop Bob Osborne, W8ZM, a note of inquiry.

More Mail

San Diego, California—A note received from "Red", W6BLK, concerning 1296 *mc* "An item of interest is perhaps our 1296 *mc* activity here in San Diego. In September, 1958 I contacted W6JRK in La Crecenta, a distance of 130 miles for the first time on 1296 *mc*. This contact led to regular skeds, first on two meters, then cross-band two and 1296. This stirred up considerable interest in the area and led to the forming of the 'Microwave Group'."

"Other stations worked over a hundred mile path are W6DQJ, W6MMU and W6SSB. Things are 'looking up' in the area for 1296 *mc* and higher and by spring or early summer when signal propogation is optimum at these frequencies, I expect at least half of the 24 members of the 'Microwave Group' will be on 1296 *mc* or 10 *kmc*."

Bellport, New York—Another comment on 1296 *mc* from Charlie, (W2LRJ): "Presently working 220 *mc* and 432 *mc*. Have a couple of par-amps for 220 and another in the works for 432. Also in the works is a 4X150 for 220. Probably I will not concentrate too hard on 432 except that it is on the way up to 1296 *mc*."

"Looks like I'll build W1OOP's convertor and try a par-amp for it. Boy, if I only had more time!" *So say we all, Charlie. Good luck and keep with it.*

Greenville, South Carolina—From an old six meter friend, Leroy Lawhorn, W4VIW:

"Just a note to let you know that there are two *vhf* stations on 1¼ meters in Greenville, South Carolina. They are Charlie Dellinger, (W4TLC) 220.200 *mc* (also on 2 and 6 meters) and Leroy Lawhorn (W4VIW) 220.050 *mc* (also on 2 and 6 meters). Don't know of anyone else operating this band in the state of South Carolina."

"Sure looking forward to the next *vhf* contest. How about some skeds fellows? In short openings I would like to hear the name of the state more frequently." *This is good news from your fair state, LeRoy, now maybe some of the others will get together with you for your 1¼ work.*

West Liberty, Ohio—John Wentz (W8HFK) tells what he's using on six: "Have been on six meters for more than a year now and am the only active six meter station in Logan County. Our rig is a Lettine 242 transmitter, S-40B Receiver with a GEM converter, and using a five element Hy Gain beam. We are on every evening at 2230 EST at 50.1" *Thanks for the info John, glad to know someone is active on six in Logan County.*

73, Sam, W1FZJ

CONTEST CALENDAR

Frank Anzalone, W1WY
14 Sherwood Road
Stamford, Conn.

April 30—May 1	PACC CW
May 7— 8	PACC Phone
May 7— 8	USSR DX
May 14—15	Bermuda
May 28—29	Bermuda

P A C C

CW Starts: 12.00 GMT Saturday, April 30th.
Ends: 20.00 GMT Sunday, May 1st.
Phone Starts: 12.00 GMT Saturday, May 7th.
Ends: 20.00 GMT Sunday, May 8th.

The object of the 5th Annual PACC contest is of course, for stations outside the Netherlands to work as many PA stations as possible on all bands 3.5 thru 28 *mc*.

Check last month's Calendar for rules and list of provinces which will determine your multiplier.

Your logs go to: P.v.d. Berg, Contest Manager, Keizerstraat 54, Gouda, Netherlands.

USSR DX

Starts: 21.00 GMT Saturday, May 7th.
Ends: 21.00 GMT Sunday, May 8th.

This is an international CW Contest, so don't concentrate on working USSR stations only.

The rules were made available to us for the first time and you will find a full coverage in last month's Calendar.

A couple of points to remember.

1. Send in your log for the full time of operation but indicate what consecutive 12 hour period you wish to submit for competition. Only this 12 hour period will be considered.

2. Your multiplier is the number of different countries worked on all bands. *Not* the sum total from each band.

3. Don't forget the three additional certificates that are available during the contest period.

Mail your logs before May 15th to: Central Radio Club, Att: Chief Judging Board, P.O. Box 101, Moscow, USSR.

Bermuda

Starts: 00.01 GMT Saturday, May 14th.
Ends: 23.59 GMT Sunday, May 15th.

[*Continued on page 110*]

Results of 1959 VK/ZL Contest

PHONE

United States

W2WZ	750	K5MDX	1150	W5INL	345
K2OYN	285	K5KBH	920	W6LDD	650
W3DHM	665	W5KC	490		

Winners other countries.

No. America		JA3JM	685	G3FPQ	990
KZ5LC	550	KR6QB	750	OH5SM	795
TI2OE	1185	9M2DQ	1285	ON5GM	530
VE6IN	115	**Oceania**		OZ4FA	540
XE1CP	755	KH6BXU	640	PAØMRN	110
Africa		**So. America**		SM3BIZ	285
VQ3GL	120	No entries		UR2BU	815
ZS6UR	295	**Europe**		CT1EY	645
Asia		DL3LL	990	LA5HE	110
HL9KJ	405	EA3JE	750		

C W

United States

W1JYH	960	W4NPT	1575	K6ICE	860
W1VG	950	W4FFF	725	W6PHF	735
W1WY	945	K4UEE	575	W6ATO	655
W1KQF	775	K4KBH	1945	K8NLJ/7	290
W1AWE	640	W5KC	1550	W8BHW	2160
K1CUD	60	K5UYF	595	W8JIN	1785
W2EQS	1970	W6GHM	3095	W8MCC	280
K2DGT	1540	W6IBD	2665	W8YPT	225
K2UVU	730	W6KG	2340	W8SPO	170
W2NHH	285	W6LDD	2295	W9WNV	1775
W3DBX	1820	W6NKR	1790	W9SWR	530
W3OCU	985	W6ID	1265	W9KXK	480
W3ARK	940	W6YVO	1240	WØYCR	1170
W4BJ	1805	W6IPH	1095		

Winners in other countries

No. & So. America		JA1VX	2330	IT1AGA	60
CE3AG	1275	VS6BJ	395	LA5HE	420
KZ5LC	510	**Oceania**		OE1ER	1170
PY1ADA	875	KH6BXU	1850	OH3TY	705
TI2CAH	995	KR6MG	570	OK1KLV	285
VE3BY	980	VR1B	2140	ON4FU	1105
Africa		**Europe**		OZ6HS	120
FA8RJ	400	DL1KB	1495	PAØVO	580
ST2AR	740	F8TM	220	SM5CCE	750
VQ2CZ	715	G5RI	1380	SP6FZ	335
ZS6NE	1155	GI4RY	55	TF3AB	115
Asia		GW3JI	915	UC2AR	110
BV1USB	880	HA1KSA	530	UF6FB	55
		I1ER	55	UR2BU	650

VK ZL Winners

PHONE

VK2AKV	1340	VK5MS	8050	ZL1ACI	4675
VK3AEE	5960	VK7WA	2385	ZL2AHZ	3165
VK4DO	1180	VK9NT	3305	ZL30B	2725

C W

VK2ADE	11150	VK5BS	5100	ZL2GS	8935
VK3DQ	9715	VK7JB	7655	ZL3OB	6120
VK4TY	6460	VK9XK	7490	ZL4GA	10755
		ZL1AH	14455		

sideband
sideband
sideband

SIDEBAND

Irv and Dorothy Strauber, K2HEA/K2MGE
12 Elm Street, Lynbrook, New York

SSB DX HONOR ROLL

TI2HP	200	W1GR	134
W4IYC	195	W9QNO	129
TI2RC	195	W6JNU	129
VQ4ERR	190	W2CFT	124
W8EAP	175	W1EQ	123
K2MGE	165	W5DA	123
K9EAB	158	KØCTL	123
HB9TL	151	W1TYQ	122
WØCVU	150	W2OTZ	118
W2TP	150	W3VSU	118
W2VZV	150	KZ5WZ	115
K2HEA	145	DL1VR	114
MP4BBW	141	W2MAF	113
ON4DM	139	W1LHZ	113
W8YIN	137	W6UPP	112

The 4th Annual CQ SSB DX Contest was the most enjoyable and active contest ever participated in by sidebanders. Comments attached to the contest logs, pouring in from all over the world, indicate that, despite the keen competition, the clean operating practices of the sidebanders distinguished this contest. This is in spite of the fact that the rules were not fully understood and that news of the contest did not reach SSBers in some parts of the world. We hope to change this next year by mailing, to each DX operator, log sheets and explicit rules well enough in advance to enable everyone to participate. Many suggestions have been received in the interest of better procedure and all will be carefully considered in plans for the next contest.

Among the top scores thus far submitted were the following stations:

CN8JF	87,116	KH6DLF	27,887
TI2HP	79,632	W6ONP	27,018
HB9TL	75,565	SM6SA	26,796
GI3CWY	73,660	ZS5JY	26,634
W2SKE/2	53,954	TG9PS	26,180
KL7CDF	48,668	KA2CB	23,532
KZ5WZ	34,650	XE1SN	21,300
DJ1BZ	33,840	W4HXC	21,280
W9EWC	33,384	K5IIN	20,502
I1CWX	32,856	SVØWV	16,830

Announcement of the winner and top scorers will be published in the July issue of this column.

Alan, ZS6NE, taped the contest for about eight hours, spent 100 hours editing the results, and came up with a terrific LP record of excellent quality and complete intelligibility which should be of interest to all SSB DXers. Many calls are heard on the record and, more than likely, yours is among them. If you'd like one of these records, send $5.00 to Alan, Box 6216, Johannesburg, Union of South Africa; then sit back and listen to how the W/K stations sound to DX stations during a contest!

Our new DX Honor Roll this month contains the calls of the stations who answered our request for confirmed countries worked to date. Each month we will list, in order, the calls of the top fifty stations with the largest number of confirmed DX contacts. If your total belongs on this list, a card or letter with your total verified by another ham, will entitle you to membership in this select group. Your call will be carried for three months; if you do not claim additional credit at the end of that period, your call will be removed to make room for another station. We will automatically enter your call or correct your total when issuing stickers for each 25 countries worked after issuance of your "Worked 100" certificate.

Among the big news of the month on SSB is the laudable achievement of Humberto, TI2-HP, who received his 200th confirmation from ZE3JA/ZD6 on Feb. 11, one day before the celebration of his birthday. To add further interest, both his nearest competitors for the title of "First Station to Get 200 Countries on SSB Confirmed," Bob, TI2RC, and Myron, W4IYC, were among the guests at Humberto's birthday fiesta to help celebrate both happy occasions. Myron and XYL, Ginny, spent part of their vacation with the Costa Rican SSBers and then visited Grand Cayman Island and Puerto Rico. Our warmest congratulations to T12HP for his noteworthy accomplishment.

From Frank, W2AMJ, comes news of Hammarlund's new exciter, the HX-500. Using a pair of 6146's, running 100 watts PEP output, the unit covers 75 to 10 meters and covers all modes, including FSK. Frequency stability claimed is better than 100 cycles after warmup and frequency readability better than 200 cycles. Some real fine features include adjustable ALC, adjustable power output control for use with your linear power amplifier where less than the full output of the unit is needed, and, for the FSK boys, a 40 cycle identification key shift which is superimposed on the carrier so that 10

minute identification is accomplished with a flip of the switch and a swipe of the bug. Sounds like the air will resound with real fine signals with the wealth of fine equipments being put out by our leading manufacturers.

Want up-to-the-minute DX news? Listen for Mickey, W8YIN, who is issuing daily DX bulletins on 14,329 *kc* in his capacity as DX Editor for the SSBARA. Mickey's schedules are as follows (all times GMT): 0130, 0630, 2000 and 2200. If you have any hot tips on SSB DX, pass them along to Mickey, and he'll be happy to share them with the rest of the SSBers.

Eldico 100F owners can make use of the now otherwise engaged 11 meter band by converting their exciters to 6 meter sideband, using the available circuitry with some changes. According to Al, W6ONP, the SSB-100-F can be converted to 6 meters in about three hours without disturbing the other bands. No holes are drilled in the panel or cabinet and direct calibration of the band can be accomplished on the VFO dial. If you would like complete information about the change and a circuit diagram, drop a note to Mike Kraus, W2HKY, R.E.L., 29-01 Borden Ave., Long Island City, N.Y., and he'll forward the data to you.

SSB Around The World

Congratulations to Ramsay, VK4AB, who recently became a bridegroom. . . . Stan Davies, famous as VK9AD on Norfolk Island, is now VK3AWK in Victoria, Australia, with the same wonderful sense of humor that distinguished his operations in the past. . . . There are now three Eire stations operating on 20 meter SSB: EI4Q, EI2X, and EI8P. . . . Jim, JA1ACB, is awaiting the passport that will enable him to operate from Marcus Island about the beginning of April on CW and SSB. We were told his SSB frequency would be 14,100 *kc* with 40-55 watts PEP. Bill, VE7ZM, is his QSL manager and also performs the same duty for TA3GI, LA3SG/P, and HP-9FC/VQ8. Unattached American stamps are acceptable to Bill in addition to the self-addressed envelope. . . . We must commend Oliver, ZS5JY, for the smoothness of his operations during his DXpeditions to ZS7-, ZS8-, and ZS9-lands during February. Other DXpeditions would do well to follow Oliver's example of selective calling. . . . KS4AZ, operating from Swan Island, was another commendable operation carried on under difficult conditions. W4JNE, W3KA, and W4-KFC used a 32RS1 modified for lower SSB only with 100 watts PEP to a dipole with a fixed frequency of 14,271 *kc*. Still a large number of DXers managed to work them, amidst QRM, with good reports from both ends. . . . We hope that Doc, W5PQA, took the KWM-1 to East Pakistan and that you all added a new country to the list. . . . Buggy, VQ2AB, prefers 10 meter SSB and can be heard daily around 28,640 *kcs*. His QSL address is Box 1517, Ndola, N. Rhodesia. Thanks to Robby, VQ4ERR, for sending along

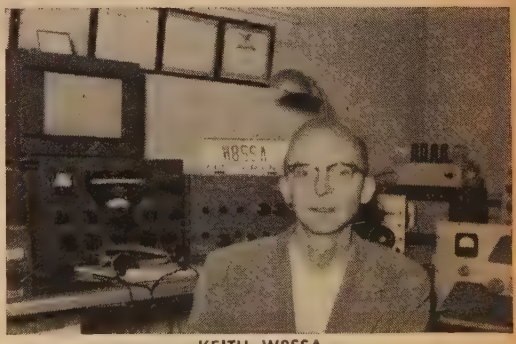
[*Continued on page 112*]



MORRIS, W4CXO



FERNAND, ON4DM



KEITH, W8SSA

ART, ZS6AQQ and JOE, W4IMP





Citizens Radio

Lee Aurick, W2QEX/2W2870

Seven months ago we discussed the Gonset G-11 in this column, and it's interesting to note that the boys out in Burbank haven't been resting on their laurels since then. As proof, we've just completed a month of intensive use and investigation of the new Gonset G-12 Citizen's Communicator.

The new unit embodies all of the excellent performance characteristics found in its predecessor, and comes up with a few new ones. It is a full inch lower, only a quarter inch wider, and just a little deeper; despite adding three more channels for transmitting and receiving, and a second power supply.

The G-12 boasts 4 channels and may be purchased for either 117 volt *ac* and 12 volt *dc* or 117 volt *ac* and 6 volt *dc* operation. These two factors add greatly to its flexibility.

As indicated in the photograph, the transceiver comes equipped with a mounting bracket that may be detached, or pivoted to suspend the unit from a dashboard. When moving the rig indoors, it is only necessary to remove the two thumb screws to release the complete station from the mounting bracket.

The press-to-talk microphone, holder, *dc* power cord and one set of crystals are included.

A great deal of latitude in antenna installation is provided by the pi-network output circuit in the transmitter. A good match to any of the C/B antennas on the market should be obtained easily in your installation.

Crystal Accuracy

An offer by W2PGW/2W4584, who has access to precision lab gear, to measure the output frequency for compliance with the regulations was eagerly accepted. He reported a discrepancy of *only 30 cycles* from the indicated channel frequency. It would be difficult to maintain an accuracy better than this, and as this is *well* within the .005% tolerance, this particular unit should never be guilty of straying off frequency.

As an interesting aside to this phase of the investigation, W2PGW/2W4584 further reports that the "trimmer", associated with most crystal circuits, can be adjusted to move the output as much as *10 kc either side of the frequency indicated on the crystal.* This condition exists for all units employing 13 *mc* crystals. For those C/B rigs using overtone 27 *mc* rocks, the possible variation can be *as much as 30 kc.* This bit of information would appear to be the dominant reason for the large number of off-frequency citations issued by the FCC.

It is for just this reason that *each* manufacturer specifies that his crystals only be used in his gear.

Should you subsequently desire to change channels from those supplied with your equipment (and carefully aligned by the manufacturer) our suggestion would be to seek out an expert in the form of a communications company doing maintenance on police or taxi installations. The average TV or radio service shop does not have the facilities, the experience, or the necessary *license* to assure you of the accuracy required by the Commission.

G-12 Tube Complement

The receiver uses a 6AU6 *rf* amplifier; 6U8A oscillator/mixer, 6BJ6 1st *if*, 6BA6 2nd *if*, ⅔ of a 6AV6 detector, 6AL5 *avc*/squelch/noise limiter, ⅓ 6AV6 audio, and a 6BQ5 output stage.

The transmitter uses a 6CX8 as oscillator/amplifier, and, as is customary, the audio and output tubes in the receiver function as speech amplifier and modulator.

To assist you in getting the most out of the transmitter, a tuning lamp is included on the front panel, and the amplifier tuning and output controls are readily accessible on the right side of the cabinet beneath small plug-buttons.

The G-12 is readily identifiable, both in performance and quality of workmanship, as another product of the company that has made

the word "Communicator" synonomous with Gonset.

Tuning Indicator

An extremely handy device, the Globe Tenna-Meter, has been in use for the past two months.

This very compact unit compares incident power (going toward the antenna) with reflected power (going toward the transmitter).

With the transmitter output connected to the *Input* of the Tenna-Meter and the antenna connected to the *Output* terminal, the device provides a reliable indication of the maximum output position of all tuning controls.

By reversing the cables (antenna to *Input* and transmitter to *Output*) a *relative* indication is obtained as to antenna match and efficiency.

Simple instructions are included with the unit and its use is by no means confined to C/Bs.

Checks have been conducted with existing antennas on 40-, 15-, 10- and 2-meters, and it now looks as though another piece of gear, originally designed for C/B use, will find wide application in general ham operation. For tuning up it can't be beat, and some of the rigs currently under test that sport tuning lights on the front panel have been found to give misleading indications. One transceiver actually delivers maximum power to the antenna when the lamp is nearly out. It would be difficult to part with this device, and there is little doubt that with "antenna weather" now here, the Globe Tenna-Meter has only begun to work for us.

73 de Lee, W2QEX/2W2870

Amateur Radio Legal Notes

Maurice J. Hindin, W6EUV
6505 Wilshire Boulevard
Los Angeles 38, Calif.

The case of the Village of St. Louis Park vs. Thomas J. Casey is a landmark case in which no question of federal control was involved. It was a case between a "ham" and the officials of the town in which he lived. The case went through all of the state courts of Minnesota and finally was decided in 1944 by the Supreme Court of the State of Minnesota. The case is cited *in legal reports* as *16 N.W. 2d, 459; 155, A.L.R. 1128.*

Mr. Casey was a "ham" and he erected a 30 foot telephone pole in his yard and mounted a 3 element rotary beam on it. The village of St. Louis Park where Casey lived had a zoning ordinance which prohibited the use of property in a residential zone for any use other than uses incidental to private homes. The city officials brought an action against Mr. Casey to compel him to remove his antenna pole and beam on the ground that amateur radio is not an incidental use of residential property.

This case was of particular interest because most cities in the United States have zoning laws. Almost all zoning laws in turn set up a residential zone within which only private residences may be built or maintained. If the city's contention in this case was upheld by the courts, then any city with such a zoning ordinance could effectively control amateur radio.

The Supreme Court of Minnesota held as a matter of law that amateur radio activity is a proper incidental use for residential property, and, therefore, held that the city could not compel Casey to remove his antenna.

The Supreme Court used the following interesting language:

"The use of short-wave amateur sets for both reception and transmission is so common in the United States that the Federal Communications Commission licenses such sets for transmission within certain wave lengths . . . that many if not most of these amateur stations are operated in connection with residences is too well known as a fact to be ignored."

This judicial recognition of amateur radio work by the Supreme Court of Minnesota was a first in recorded reports of any state court of last resort. The case has been repeatedly cited as legal authority for the proposition that in and of itself amateur radio activities do not violate residential zoning restrictions and that it is a proper incidental use for residential property.

There was no question in the Casey case with reference to violation of any building ordinances or safety ordinances.

It should not be taken for granted, however, that the case of St. Louis Park vs. Casey stopped or answered the attacks of local city authorities against amateur radio activity. Many cities, while accepting the doctrine of the St. Louis Park vs. Casey case have sought to harrass and restrict amateur radio activity through ordinances involving building restrictions, building permits, electrical or engineering requirements, and other types of restrictive ordinances.

The Casey case did not consider any questions which may have arisen out of municipal ordinances relating to building restrictions, building permits, engineering requirements or the like. The Casey case dealt solely with the question of the propriety of Amateur Radio operation as an incidental use of residential property in a residential zone. Fortunately for amateur radio, the outcome was favorable.

YL

by Louisa B. Sando, W5RZJ
212 Sombrio Drive, Santa Fe, N.M.

3rd International YLRL Convention

Nearly every month since the YLRL Convention was announced, this column has carried some details of planning by the members of WRONE, sponsoring YL club. Now with the convention only weeks away, it's time to summarize:

What—The 3rd International YLRL Convention
When—June 17, 18 and 19, 1960
Where—Hotel Commander, Harvard Square, Cambridge, Massachusetts
Convention Chairmen—W1ZEN, Onie Woodward, and W1SVN, Mildred Doremus
Registration—$10 for YLs (this includes coffee break, luncheon and banquet on Saturday, picnic on Sunday). $5 for OMs of the YLs attending (banquet and picnic).
Convention Tickets—May be purchased from Eunice Gordon, W1UKR, 55 Malibu Drive, Springfield, Mass.
Hotel Rooms—At the Hotel Commander, $8 single with bath; $15 for twin bed room and bath; reserve via W1UKR as above.
Prizes—Will be numerous. A most unusual one will be the souvenir convention bedspread made of embroidered squares, replicas of the YL certificates currently available. Tickets for this (which will be good for a second drawing for a handmade lace afghan), may be obtained from Chata Swenson, W1RLQ, Box 193, Morningdale, Mass., for 25¢ each, or 5 for $1.
Ye Olde WRONE Gift Shoppe—Selling YLRL stationery, pins, etc., copies of "CQ YL," and souvenirs, will be in charge of W1CEW, Mary Hinterland.

Here are some details of the actual YLRL Convention program:

Friday, June 17 — **Hotel Commander, YLRL Suite**
2-5 p.m. Informal Registration for YLs and OMs
8 p.m. Informal Get-together

Saturday, June 18 — **Hotel Commander, George Washington Ballroom**
9-11:30 a.m. Registration
9:30 a.m. OMs: All-day Tour
Millstone Observatory
Lunch on the road
Visit to Radio Shack
Return to Hotel about 4 p.m.
9:30 a.m. YLs: YLRL Forum
Welcome—W1HOY
Business Session—W6DXI
10:15-10:30 Coffee Break (on the spot)
11:30 a.m. Recess
1:00 p.m. Luncheon
Greeting from K6ENK, W1QON, W5RZJ, and any DX YLs present
Introduction of first-year YLRL members
Introduction of long-time YLs
Picture taking and identification of YLs present
Bedspread Drawing and prizes
4:00 p.m. Recess
6:00 p.m. Cocktail Hour
7:00 p.m. Banquet
Speaker: Father Dan Linehan, W1HWK, Director of Weston Observatory, presenting his Scientific Travels from a "Ham's Eye View"
Prize drawing

Sunday, June 19 — **QTH of W1FZJ/W1HOY, Medfield, Mass.**
12:30 p.m. Informal Picnic and Gabfest
Swimming Pool (bring your own suit and towel)
Prizes

A lot of YLs have been planning for many months to take their vacations in June, destination Cambridge. We'll be there—will *you*?

Sightless YL twins, K1EIR, Barbara, and K1EIC, Elizabeth Lombardi, at their rig at Shelton, Conn.



Twin YLs

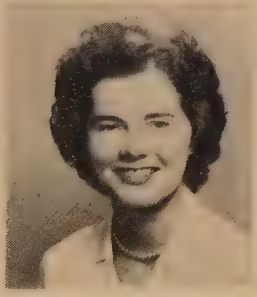
You may have read about the Lombardi twins in *YL Harmonics*. Blind since premature birth, they have been "seeing" the world through sound since they got their Ham licenses—Novice in Jan. '58 and General in Feb. '59. Their uncle, W1VGP, got them interested and they studied by means of records supplied by the Library for the Blind in N.Y.C. and from special Braille books. Barbara (Barb) is K1EIR and Elizabeth (Bet or Betsey) is K1EIC. They prefer CW to Phone and operate 80, 20, 15 and 10. During the week the twins attend the Oak Hill School

in Hartford, Conn., a State school for sightless children, where they board, and return to their home and Ham gear in Shelton on weekends. They helped fellow student Marianne Ring get her license, KN1LFW, and the three girls are now conducting radio classes at school with the aim of possibly having a school station.

Another Young YL

You will like to meet is WA2CPT, Pat Kiernan, of Freehold, N. J. Pat is 17 and completing her senior year in high school. She became interested when her grandfather, WA2CPS, invited her to attend a code class with him at the Monmouth ARC in the summer of '58. That fall she got her Novice ticket and went on the air with a borrowed 25-watt transmitter. Some months later her dad, now WA2FGO, became interested and they put together a Heathkit DX-40. In July '59 they went for Generals and since then it's been a race to see who can work the most DX (so far Pat is ahead). They've added a *vfo,* an HQ-110 receiver and a 3 element beam for 15 meters.

Pat is a majorette, sec.-treas. of K2JRJ, the high school radio club, and has served as sec'y of the Monmouth ARC. She also has helped teach code to an adult class at her high school. Pat plans to enter Cornell Univ. in the fall to take a pre-veterinary course.



Seventeen year old Pat Kiernan, WA2CPT.

Teen-age YL Net?

Marolyn Gwinn, W8WUB, writes: "For some time I have been thinking it would be nice to get a teen-age YL net started. It would probably be best to hold such a net on 20 meters and since most of us are in school it would have to be either at night or on weekends. But I'd like to hear what the other girls think about it." Any teen-age YL interested can write W8WUB at 1666—11th Ave., Huntington, W. Va.

YLRL Certificates

YLRL President W6DXI, Gladys, informs us that Alaska and Hawaii will count both for State and DX when working for YLRL's WAS/YL and DX-YL certificates.

With the Clubs

New officers for GAYLARK of Houston: Pres., K5MIZ, Alverta: V.P., W5DRA, "Teev"; sec-treas. K5YTT, Grace; historian, W5CXM, Phyllis.

The 1959 officers for the South African Women's Radio Club are: Pres. ZS6GH, Diana; V.P., ZS6YL, Toni; sec'y, ZS6KK, Marie; joint editress of *YL Beam,* ZS6YL and ZS6GH; certificates custodian, ZS1RM, Margery Snyman, P.O. Box 80, Strand, Cape Province, S.A. Certificates offered: W.A.Y.L.—10 cards required from YLs worked in ZS, ZE, VQ2, CR7 and OQ5; contacts count from July 1, 1952. Cost: 2 shillings, 6 pence (35¢). K.K.K.—100, 500 or 1000 contacts worked on cw. Stickers for 100, 500 and 1000 contacts; contacts count from Jan. 1, 1957. Cost, 70¢.

Additional Central Fla. Floridora YL net: Thurs., 50.330, at 2000, net mgr. K4ANR. Renewed: Floridora YL phone net, Sunday, 0900, 7225, K4UIZ ANCS.

Custodian of the Texas YL Round-Up Net YL-OM 10CC certificate is W5RYX, Lyn Ohlson, at this new QTH: 8928 Hackney Lane, Dallas 18.

Members of WHO at Ft. Worth kept their club call K5LZW on the air from Jan. 29-Feb. 7 operating portable from the Fat Stock show where they passed several hundred messages from show visitors. New sec'y for WHO is K5VLW, Lillian.

Chicago YLRL offers complete rules for earning the "Dark Eyed Queens' Certificate." Custodian: K9JVL, Lil Rochelle, 3638 Ruby St., Franklin Park, Ill. Contact 5 members of Chicago YLRL on or after Jan. 1, 1960 (net contacts excluded); send the five QSLs to custodian showing time, date, A1 or A3, call, and band. Include 10¢ (no stamps) to cover cost. Members to look for: W9GME, K9's JDE, CQF, CMZ, OSS, LIW, LYG, PDS, UHD, GUB, JVL.

"CQ YL"

Want to know more about that YL you worked yesterday, last week—or may work tomorrow? Get your copy of "CQ YL," the one and only book devoted to telling the very active part the YLs are playing in this hobby. 169 pages, over 500 photographs; $3, postpaid. Order from this column editor (QTH at head of column).

33, Louisa W5RZJ

These members of WRONE met to put together the embroidered squares, representing the YL certificates, for the souvenir bedspread to be awarded at YLRL's 3rd International Convention in June. L. to r., front: W1RLQ, K1IZT; back, W1ZEN, K1EKO, W1HOY.



MAXIMUM PERFORMANCE AND MECHANICAL SUPERIORITY

hy-gain VHF Hi-banders

FOR 2, 1¼ AND ¾ METERS

"The World's Largest Manufacturer of Amateur Communication Antennas"



2 Meter 5 Element

Hy-Gain's 5 element 2 meter Hi-Bander is small and extremely light weight (2¾ pounds) and may be rotated by any TV antenna rotor. Although designed for years of trouble-free installation it is also very convenient for semi-permanent or portable VHF applications. The beam is completely factory pretuned and quick and easy to assemble. May be fed with either coax or parallel transmission lines. Boom length 5' 4". longest element 41¾ inches.

9db Gain
MODEL 25 **$8.95**

2 Meter 10 Element

The world's most popular 2 meter beam, the 2 meter 10 element Hi-Gain Hi-Bander is still small and light weight (4¼ pounds) enough to be rotated by any TV rotator. NO COMPROMISE DESIGN DEVELOPS THE TREMENDOUS FORWARD GAIN OF 13.4DB WITH EXCELLENT FRONT TO BACK RATIO CHARACTERISTICS. Boom 12 feet long, longest element 41¾ inches. May be fed with either coaxial or parallel transmission lines.

13.4db Gain
MODEL 210 **$14.95**

1¼ Meter 11 Element

The same high quality construction as the 2 meter series results in an extremely strong yet light weight (3¾ pounds) 220 megacycle beam with a boom 12 feet long and the longest element of 27 inches. A pretuned advanced design folded ratio dipole is used and specifically designed for low loss 450 ohm open wire transmission lines. (Open wire low loss lines are a must for minimizing feedline losses on 220 megacycles.) This great performer has proven itself in many pioneering amateur projects in this challenging VHF band. Optimum Spacing and high Q rod element design result in the very high gain of 14.2db.

14.2db Gain
MODEL 111 **$13.95**

¾ Meter 13 Element

One of the highest gain (16.1db) and efficient extended multi-element Yagi's ever commercially manufactured for amateur communications purposes, the Hy-Gain ¾ meter, 13 element Hi-Bander makes consistent long-range contacts on 430 megacycles a reality. Boom length 8 feet. Longest element 13¾ inches. Net wt only 2¼ lbs.

16.1db Gain
MODEL 313 **$12.95**

hy-gain antenna products

8135 NO. 22nd ST. • LINCOLN, NEBRASKA

NEW BETA MATCH

Both the 5 and 10 element 2 meter arrays use the revolutionary and exclusive new Hy-Gain beta matching system. Although it is completely factory pretuned and requires no further adjustment to result in an SWR of less than 1.5:1, it is fully adjustable to compensate for variables encountered at each installation site. Instructions are furnished for feeding the 2 meter series with almost any of the commonly used coaxial or parallel transmission lines. Completely unaffected by weather, the beta match also allows tuning of the array for maximum forward gain and front to back ratio with no compromise to facilitate matching.

CONSTRUCTION AND DESIGN FEATURES

All Hy-Gain Hi-Banders are ruggedly constructed of heavy wall 1¼" diameter heat treated alloy aluminum tubing booms and 3/16" diameter solid rod elements. They are built to withstand extremely high wind velocities and heavy ice loading conditions. All Hi-Bander beams are optimum spaced, which together with the advanced design high Q solid rod elements result in tremendous forward gain and excellent front to back characteristics. Elements are insulated from and firmly attached to the boom by the exclusive Hy-Gain high impact cycolac formed bracket. Both boom and element ends are plastic capped and all hardware is hot dipped galvanized and iridite treated in accordance with military specifications for maximum weather ability.

DUAL STACKING KITS
+ 3db Gain

Two Hy-Gain VHF Hi-Bander beams may be stacked to produce an additional 3db gain (equal to doubling the power) with considerable reduction in vertical beam width concentrating maximum power at low vertical angles which are so important in VHF propagation. These stacking kits are complete and include all necessary hardware and complete assembly instructions (less mast). Order by antenna model number. Model DS Stacking Kit $4.95 ham net.

QUAD STACKING KITS AND FRAMES
+ 6db Gain

Stacking four (two by two) Hi-Gain VHF Hi-Bander beams results in the tremendous additional gain of 6db (equal to four times power) together with the all important reduction in both vertical and horizontal beam width. The quad stacking arrangement results in the maximum concentration of radio frequency energies within the mechanical limitations of most amateur installations. The quad stacking kits are complete, including all hardware and assembly instructions, (less mast and mounting frame). Order by antenna model number. Model QS stacking Kit $15.95 ham net.

Quad stacking frames are also available. They are constructed of extra heavy duty steel and heat treated alloy aluminum tubing, especially designed positive grip tubing mating brackets and iridite treated hardware. These stacking frames will mount in the proper relationship 4 Hy-Gain VHF Hi-Bander beams and will withstand heavy ice loading and high wind velocities. Order by antenna model number. Model SF, ham net $59.95.

ALL HIBANDERS GUARANTEED FOR 1 YEAR

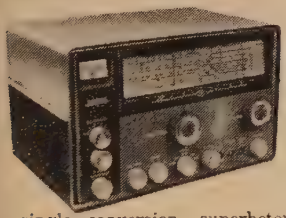
For further information, check number 57, on page 126



this is "the house the hams built"

Here, Leo I. Meyerson, WØGFQ, and Alan McMillan, WØJJK, discuss the very best terms to be offered a customer on trade in of his present equipment. Top trades can always be given because World Radio's expert Reconditioning Department and ready Used Equipment market insure fast turnover. On new gear, late serial numbers are guaranteed, easy financing is readily available, and promptest, most personalized service is offered. Buy now at World Radio . . . "the house the hams built!"

and National's NC-109 Receiver



$169.95

$17.00 Down

$10.00 Per Mo.

A single conversion, superheterodyne receiver employing a tuned RF stage, a high frequency mixer and separate high-frequency oscillator, two stages of IF amplification at 455 KC, separate AM and heterodyne detectors, an automatic noise limiter, two stages of audio amplification and a separate "S" meter amplifier. Covers 540 KC to 40 MC in four bands including broadcast. Receives AM, CW and SSB. Calibrated electrical bandspread for 10, 15, 20, 40 and 80M amateur bands. Logging scale for shortwave. National's exclusive new "Microtome" filter for extra selectivity.

on the National scene . . .

NC-303 HIGHEST MECHANICAL STABILITY OF ANY "HAM BAND ONLY RECEIVER"

NC-303 LOWEST THERMAL DRIFT OF ANY "HAM BAND ONLY RECEIVER"

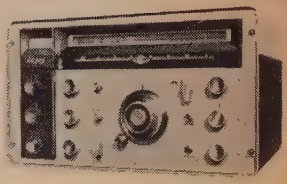
NC-303 THE ONLY RECEIVER PROVIDING NOISE LIMITERS ON BOTH SSB AND CW

the NEW National NC-303 Receiver

$449.00

$44.90 Down

$20.00 Per Mo.



1. **NEW** front panel SSB selector with exclusive new "IF SHIFT for instant side-band choice . . . eliminates retuning or detuning.
2. **NEW** "Q" Multiplier provides razor-sharp rejection notch (more than 60db deep). May be tuned continuously across entire receiver passband. Separate notch frequency and notch depth controls.
3. **NEW** 5-position IF selector provides sharp, SSB-1, SSB-2, medium and broad selectivity. .5 Kc, 2 Kc, 3.5 Kc and 8 Kc band-widths provide optimum selectivity for SSB, CW, phone, phone net, VHF plus sideband selection.
4. **NEW** dual noise limiters. Separate automatic noise limiter for AM. Separate double-ended manual limiter for CW and SSB.
5. **NEW** tone switch provides for attenuation of highs, lows, or both for maximum readability.
6. **NEW** exclusive WWV converter provision. No interference with dial calibration or frequency coverage. Accessory calibrator provides two microvolt sensitivity on 10 mc WWV frequency.
7. **NEW** hi-speed, 40-1 tuning knob with logging scale.
8. **NEW** fine tuning vernier dial drive provides super-precision for CW and SSB tuning.
9. **NEW** "Fast attack, slow release" AGC circuit. "Slow release" eliminates background noise during pauses in speech. "Fast attack" provides freedom from "thumps" or momentary overload by eliminating AGC lag.

Only 10% Down • Late Serial Numbers • Top Trades • E-Z Terms

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Dear Leo: Please send your ☐ FREE CATALOG and top trade-in offer for my present _____ on the ☐ NC-303, ☐ NC-109

NAME: _____ CALL _____

ADDRESS: _____ CITY & STATE: _____

For further information, check number 59, on page 126

GLOBE ELECTRONICS

SCOUT DELUXE

GIVES

YOU



★ Smartly styled transmitter
90 watts CW
75 watts phone
& bandswitching
80-6 meters

$149.95

Straight through operation of Final on ALL bands; high efficiency and output on ALL bands; panel adjustment of loading on ALL bands. Pi-net matches 50-300 ohms unbalanced on 80-10M, and 50-75 ohms link output on 6 meters. High level plate modulation using new 7027A modulator tube. Just plug in VFO or crystal. Dual transmitter/VFO keying provisions for CW. Extensively shielded and filtered with separate final RF shield and built-in power supply.

★ Globe VFO 755A for 10-160M includes power supply with voltage regulation. Approx. 50 RF volts output: 40 & 160M. Vernier Drive. Simply plug in. No transmitter modifications necessary. Wired: $59.95. Kit: $49.95.

Available At Your Better Distributors

GLOBE ELECTRONICS

A DIVISION OF TEXTRON ELECTRONICS, INC.
22-30 SOUTH 34TH ST. COUNCIL BLUFFS, IA.

ASK ABOUT THE NEW 2-WAY CITIZENS RADIOS.

Coming Soon! New 2-Way Radio Pocketphone!

For further information, check number 58, on page 126

MARS BULLETINS

First Army MARS SSB Technical Net

Wednesday evening, 9 PM EST on 4030 kc, upper sideband.

May 4—"Antenna Panel" by Warren Offutt, Engineering Manager; Lorne De Size, Group Leader, and Bruce Woodward, Engineer-Airborne Instrument Labs, Inc., Melville, L. I., New York.

May 11—"Frequency Control" by Dr. Gernot Winkler, Scientist, USARDL, Fort Monmouth, New Jersey.

May 18—"Communication Electronic Needs of the Future" by Dr. John V. Harrington, Division Head, and Dr. Benjamin Lax, MIT Lincoln Laboratory, Lexington, Massachusetts.

May 25—"Fundamentals of Oscillator Operation" by Robert W. Gunderson, Editor, Braille Technical Press, New York, N. Y.

Air Force MARS Western Technical Net

Sunday 2-4 PM PDST . . . 7832.5 kc, 3295 kc and 143.46 mc.

May 1—"Increasing the Versatility of the Simple Oscilliscope" by Captain Floyd W. Myers, Radar Evaluation Officer, 4754th Radar Evaluation Squadron Technical, Hill Air Force Base, Utah.

May 8—"Steps in Space" by Mr. John Herrick, Member Technical Staff, Technical Training and Scientific Relations Group, Space Technology Laboratories Inc. and Author of Rocket Encyclopedia, Illustrated.

May 15—"Operations Alert 1960, of O.C.D.M." by Mr. Post, Mr. Zimmerman and Mr. Bower, Staff Members of O.C.D.M.

May 22—"The Challenge of Inertial Guidance" by Mr. Thomas A. Fuhrman, MSEE, Member Technical Staff, Space Technology Laboratories Inc.

May 29—"Technical Net Session" by USAF MARS Technical Net Members.

Air Force MARS Eastern Technical Net

Sunday 2-4 PM EST . . . 3295 kc, 7540 kc, 15,715 kc.

May 1—Quality Control Techniques. Mr. Alfred Stein, Statistical Engineer, Riverside Plastics Corp.

May 8—Medical Electronics In Gastro-Intestinal Research. Dr. John T. Farrar, Chief, Gastro-Neurology Section, Veterans' Administration Hospital of New York and Mr. Riley Bostrom, Research Engineer, Airborne Instruments Laboratory.

May 15—The Evolution of Modern Radar. Dr. Nils J. Nilsson, Chief, Directorate of Control & Guidance, Advanced Developments Laboratory, Rome Air Development Center, USAF.

May 22—Air Crew Escape Systems. Discussion by engineers from Frankford Arsenal, USA.

May 29—Modern Materials. Discussion by engineers from Frankford Arsenal, USA.

TTERS [*from page 20*]

is makes it easy to turn, page by page—try it! The reason) and others gained popularity was *not* due to present sertions. Compare yours today with early issues, and see w far off the track you can get. I have various magazines the shelves dating back to 1939, and discarded the 192? ues (unfortunately). It is true, we move on, to keep)m going backward but discretion should be used.

Anyone can assemble the kits available today as the pplier explains and states, but if a wire is connected ong the "Old Timer" is the one to get it straightened out d make it work. Not enough time and study is applied the *art* today. Many novice licenses expire before the eneral class" is obtained, because of lack of interest in *ory*.

Even though my term of enjoying amateur radio, as I ow it, is getting shorter, is it my intentions to pursue e avocation by not only operating but also building and perimenting which is the Meat of the art. It is not onomical of course to build a suitable communications ceiver covering all bands, unless plenty of hardware and mponents are readily available. The true Ham should ild from scratch. By doing this, one can determine what wrong and how to make it work!

My primary intent of writing this letter was to call to ur attention the fact that we are not getting what we pay r in subscribing to technical magazines. We are in effect ying for mostly advertisements, at constantly increasing st. It is realized all costs are rising, but the irony of it is, lue received is going down. Today, a few *columns* are ed (often in comic dialog) to bring to light a simple *n line* bit of information.

Technical periodicals definitely need revision, at 1958 or)WER cost to subscribers. Put the pinch on advertisers! eir ads would not amount to much if it were not for bscribers. Think it over.

A. L. Albright, W5MDN
1524 Dean St.
Sulphur, La.

A Request

If you have ever written an article for publication, you can appreciate the fact that often, authors receive letters of inquiry sometimes extending over a period of years after the article was published.

We request our readers to think kindly of this situation and *always* enclose a self addressed stamped envelope with their inquiry.

Generally speaking this should contribute to the speed with which your answer is returned.

NNOUNCE [*from page 26*]

terest for young and old; prizes, contests, guest speakers id to wind things up, a banquet. For more information ntact, A. Bill Nagy at 1421 Retallack Street, Regina askatchewan, Canada.

Biloxi ARC

The Biloxi Amateur Radio Club, Inc. will hold their ird annual Hamfest on June 4 and 5 at the Community ouse in Biloxi, Miss. Registration, Bingo, dance and itch treat supper on Saturday. Hidden transmitter hunt, rab bag, door prizes, and main drawing on Sunday. rizes will be a complete Heathkit mobile rig, beam, and pe recorder. Prizes for the ladies, also. Main attraction ill be the free Shrimp Boil Sunday noon. Tickets $1.00. or more information write: BARC, Box 1574, Biloxi, ississippi.

Uniontown ARC

Uniontown Amateur Radio Club will hold its 11th Annual abfest on Saturday AM and PM, June 18th 1960. It will e held on the club grounds on the Old Pittsburgh Road, ist off Route 51, 2 miles north of Uniontown, Pa. Refreshments will be available and it is a stag affair.

GLOBE ELECTRONICS

CHIEF DELUXE

GIVES YOU



★ Self-contained
90 watt CW
transmitter
Bandswitching
10-80 meters
Wired: $79.95
Kit: $59.95

The Chief Deluxe features compact, modern design. 90 watts CW for the advanced CW enthusiast or novice (at 75 watts input). Choice of cathode or bias keying — no rewiring to use external 755A VFO, UM-1 or SM-90 modulators. Simply plug in. Built-in power supply. Husky parallel 807 final tubes for time-proven performance. New design pi-net for extra wide range matching. Standard 3-color diagrams for ease in kit construction.

★ **Screen Modulator SM-90.** Ideal for use with Chief Deluxe. Permits radio telephone operation at minimum cost. Self-contained. Printed circuit, all parts and instructions included. Kit only, $11.95.

★ **Universal Modulator UM-1.** Class A or AB-2 modulator, driver for higher power modulator or PA amplifier. Matches output impedances 500-20,000 ohms. Supplies up to 40 watts audio with proper tubes. Wired, with tubes: $49.95. Kit, less tubes, $34.95.

Available At Your Better Distributors

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22-30 SOUTH 34TH ST. COUNCIL BLUFFS, IA.

ASK ABOUT THE NEW 2-WAY CITIZENS RADIOS.

Coming Soon! New Mobile 6-Meter Transceiver!

For further information, check number 60, on page 126

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INDUSTRIES, INCORPORATED

Several qualified engineers will be selected to join in a program which is advancing the state-of-the-art of

IONOSPHERIC PHYSICS
and the study of
BACKSCATTER PHENOMENA

Background in these areas will be developed through a training program in our Bladensburg, Maryland laboratories. Engineers selected will become part of a team extending experiments of the Research and Development Department to the field, in both Domestic and Overseas assignments, and will have ample opportunity to develop technically.

They will possess a combination of the following requirements:

- BSEE, or equivalent consisting of combined civilian or military technical school plus work experience.
- Presently employed as a Field Engineer or Project Engineer.
- A good command of some of the following:
  - —RADAR, preferably High-Power
  - —HF Long-Distance Communications Systems
  - —Tropospheric or Ionospheric Scatter Systems
  - —Meteor-Burst Communications Systems
  - —Propagation Prediction—computation of propagation for long-distance communications
  - —Ionospheric Sounder Operations
  - —RDF Systems
  - —Doppler RADAR Systems
  - —Amateur Radio Enthusiast
- FCC License, 1st or 2nd Class.

They must be willing to accept assignments in areas where dependents are not permitted for periods up to one year. Differential paid for overseas assignments.

Applications Are Also Being Accepted For

SENIOR SCIENTISTS
ENGINEERS (All Levels)
LABORATORY TECHNICIANS

for permanent assignment at our Riverdale, Maryland R & D Laboratories.

Please Send Resume To:
MR. R. J. REID
Technical Employment Manager

ACF ELECTRONICS DIVISION

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INDUSTRIES, INCORPORATED
RIVERDALE, MARYLAND

Rome Radio Club Hamfest

The Rome Radio Club will hold its annual Hamfest Sunday, June 5, at Beck's Grove. There will be g speakers, entertainment, plenty of food, and goodies everyone. Tickets are $4.00 for adults and $1.25 for dren. For further information or tickets write to Mike nison, W2IXR, P.O. Box 184, Holland Patent, New Y

Mount Hermon School Contest

From May 21st at 2200 hours (EDST) to May 22n 1600 hours, The Mount Hermon School Amateur R Association—Mount Hermon, Massachusetts—will spo as an emergency-portable training activity a contest which the members will compete against each othe work the most stations with one of the three club stati The stations will be operating 80 through 10 meters both Phone and CW. All stations establishing two- contact with W1IPN/1 during this period will receiv handsome certificate from the club, a worthy addition any shack.

Mississippi Valley Hamfest

The annual Mississippi Valley Hamfest for the 1960 will be held at the GRA ELL picnic grounds, t miles east of the Quad City airport on route 6, Moline on Sunday 22, May, 1960. Advance registration for event is $1.50 and at the gate $2.00. A most interest program and a well rounded supply of prizes have b lined up and it is hoped that the weather man smile us again this year so as to make it a most enjoyable

Anyone wishing to take advantage of the advance re tration may do so by addressing their letters to the se tary of the Quad City Amateur Radio Club, R. E. Gard K9IYN, 1015 38th Street, Moline, Ill. The event will under way at 9:00 A.M. central daylight savings time will continue until the fuse blows out.

IN OUR OPINION [*from page 6*]

official sources, that the league is in possess of all the facts and that they have made ev effort along these lines. Our official represen tion has been both thorough and praisewor and credit must be given where credit is d

Security

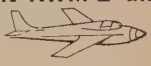
Facts being facts, it's only fair to sta bluntly, that there is a good deal of opposit to reciprocal licensing. Security has been giv as the main reason. Of course we all know t a spy would hardly go on record in any w before passing data; this would allow m chance of detection. But have you ever cons ered that our government would probably ha to maintain some sort of checking system bef allowing an alien to operate a station here? T would require personnel and time that are sim not available. It would also necessitate the ava ability of personal background data that is i possible to obtain in the case of non-citize There are many, many legitimate objections our desire for reciprocation. We feel that a go many of these can be rebuked, but they do rep sent a potential threat in the eyes of ma officials.

We wish we could discuss the many aspe



HERE IT IS AT HARVEY

THE NEW COLLINS KWM-2 TRANSCEIVER

istinctive modern styling and easy mobility make the lightweight KWM-2 an attrac-ive unit for the CAR  **BOAT**  **AIRPLANE**  **r fixed station.**

eaturing operation on all bands between 3.4 mc and 30 mc on either voice or CW, the KWM-2 has ıe quality and performance of the time-proven KWM-1 and famous Collins S/Line.

ilter type SSB generation and crystal-controlled double conversion also are eatures of the KWM-2, in addition to VOX and speaker anti-trip circuits. ALC keeps ıe signal adjusted to its rated PEP resulting in an increased average talk power.

he KWM-2 is easily moved between mobile and fixed station installations. For ıobile use, the transceiver slides into the mount and the power, antenna, elector and car radio speaker plugs connect automatically. These same four ɔnnectors are used in a fixed station installation.

he KWM-2 mobile transceiver transmits on SSB or CW with a nominal output of 00 watts for complete coverage on all amateur bands. Any of fourteen 200 kc egments of the 3.4-30.0 mc frequency range may be utilized except the 5.0-6.5 mc ange on transmitting. Other frequencies (such as MARS) outside the amateur ands may be obtained by inserting the proper crystals.

PRICE — **$1095.00**

Type/Description		Net Price
516E-1	DC Power Supply	$262.00
351D-2	Mobile Mount	$110.00
351E-4	Mounting Tray	$14.45
516F-2	AC Power Supply	$115.00
312-B5	Speaker Console	$333.00
30S-1	Linear Amplifier	$1556.00
136B-2	Noise Blanker	$120.00

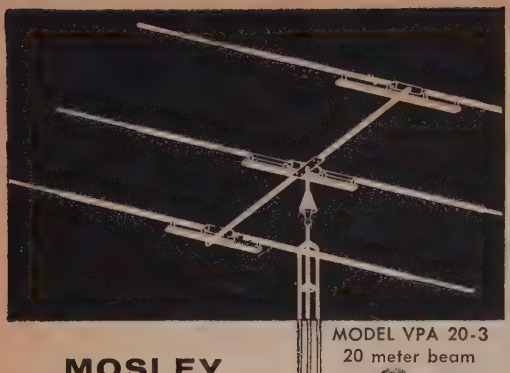
r complete versatility in either fixed station or mobile use, Harvey has a full line of Collins accessories for the KWM-2.

hrc **HARVEY** Estab. 1927 **RADIO CO., INC.**

103 West 43rd Street, New York 36, N.Y. **JU 2-1500**

HARVEY is known the world over, as a reliable source for Ham Equipment. All orders shipped same day received. If you want to talk SWAPS and DEALS write or call **W2DIO.**

For further information, check number 25, on page 126



MODEL VPA 20-3
20 meter beam

MOSLEY VEST POCKET ANTENNAS

small but mighty

A long time favorite for limited antenna space.



Mosley Electronics, Inc.

4610 N. Lindbergh • Bridgeton, Missouri

For further information, check number 26, on page 126

you haven't heard?

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COMPLETE SERVICE

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- EQUIPMENT and COMPONENTS (Ham - Electronic - Electrical)
- TRADE-INS (on new or used units)
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"YOUR FRIENDLY SUPPLIER"

Evans RADIO

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BOX 312 • CONCORD, N. H.

For further information, check number 27, on page 126

of this problem that have gone unmentioned here but it would require the majority of this month's issue to do so. There are also many aspects that open discussion might hinder right now. As new facts pop up, we'll do our very best to look into them and report on them.

Suggestion

Now that we've painted a picture that is not overly cheery, we want to make it clear that reciprocal licensing is not a hopeless task. The best thing to do is keep collecting facts, making suggestions and discussing the problem. Keep after people in high positions, and above all publicize our hobby and the fine, longstanding record of public service that *is amateur radio*. Above all, be certain that our actions abroad are always in the best taste. Never take advantage of the privileges of which we are availed. We should remember that the viewer's eye can be a very critical one and the actions of a scant few can reflect heavily on the fraternity in general.

73's, Barry, K2IEG

SWAN ISLAND [*from page 55*]

tact, so we generally avoided answering tail end calls in the interest of preserving the call-and-reply rhythm.

All in all it was great fun, and we believe that the DXpedition, as an institution, is surely here to stay and should be encouraged. We made many mistakes which we would try to avoid on a future undertaking of this kind, and we regret not having been able to hear all of those who were calling us. It was a pleasure to observe all our ham friends from this different vantage point; we appreciated the cooperation and assistance provided by many of them (W3HN, W3IWJ, W3KDP, W3SW, W3WV, W4CXA, W4GF, W4NH, W4YE, W4ZM, et al) in keeping the home folks posted, and the patience exhibited by others in standing by while such traffic was in progress.

All QSL's should be sent to W3KA, Ralph Ladd, 10406 Insley Street, Silver Springs, Maryland. Those received with self addressed stamped envelopes (U.S.A. and Canada), or with IRC (foreign) will be answered by direct mail. All other cards will be responded to through the QSL bureaus.

About the Island

Now, you may be interested, as we were, in a few facts about these outpost islands. There are no swans on Swan Island. The name is derived from the island's discoverer, Captain Swan in command of the "Cygnet" who first reported the island in about 1680. Although the dominion of the United States government was extended over the Swan Islands in 1863, the islands have also been claimed by Honduras on the basis of alleged earlier occupancy.

The larger of the two islands measures about 1¾ miles in length by ¾ of a mile wide; it is this island on which the F.A.A./Weather Bureau station is situated. Adjacent

LAFAYETTE

NEW! LAFAYETTE HE-15 CITIZENS BAND 11 METER SUPERHETERODYNE TRANSCEIVER

MADE IN U.S.A.



Not Superregenerative but SUPERHET

Unequaled Performance and Design . . . The Greatest Value In The Citizens Band Field!

64.50 COMPLETELY WIRED NOT A KIT ONLY 5.00 Down

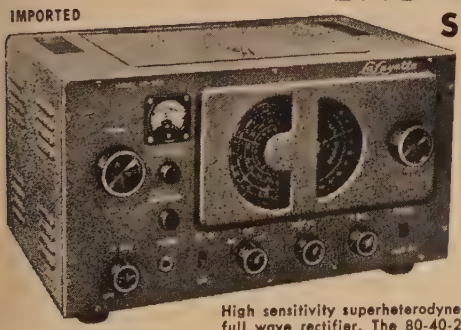
- **5 Crystal Controlled Transmitting Positions:** Operates at a maximum FCC legal power input of 5 watts fully modulated.
- **Superheterodyne Tuneable Receiver Over Full 22 Channel Band:** RF stage in both Transmitter and Receiver, 3 watts audio output, plus large 4" speaker.
- **Complete with Transmitting Crystal:** Removable front plate for easy accessibility of crystals.
- **4 Dual Function Tubes, plus 2 Single Function Tubes, plus 2 Rectifiers for 12 Tube Performance:** Compares with units costing 3 times as much. Unexcelled reception on land and sea with coverage of 20 or more miles depending on antenna height and terrain.
- **Planetary Vernier Tuning:** Controls include 3 position function switch (transmit, receive, plus transmit with spring return) and squelch noise limiter control switch.
- **High Output Crystal Microphone:** 2 positions push to talk slide switch; especially designed for sustained transmit operation with a minimum of background noise.
- **Adapts for Use Anywhere:** Modern compact styling. Brackets are supplied for easy mounting of unit in auto, truck or boat. Addition of 6 or 12 volt power supply (separately supplied) adapts transceiver for mobile operation. Only 4½"D x 6"W x 4"H.
- **Anyone Can Operate:** No examination on technical knowledge required — Any citizen 18 years or older is eligible for a license. Simply fill out FCC application supplied with HE-15 Transceiver.

HE-15	5.00 Down	Net 64.50
HE-17	Whip Antenna	Net 6.95
HE-16	Power Supply For 12 Volts	Net 11.95
HE-18	Power Supply For 6 Volts	Net 11.95

Lafayette

PROFESSIONAL QUALITY COMMUNICATIONS RECEIVER —ENGINEERED FOR THE AMATEUR

IMPORTED



Superheterodyne Circuit Utilizing 8 Tubes & Rectifier Tube

- BAND SPREAD FOR EASY TUNING
- BUILT-IN "S" METER WITH ADJUSTMENT CONTROL
- ACCESSORY POWER SOCKET PROVIDED
- EXCELLENT SELECTIVITY • ALL TRIMMERS PRE-ALIGNED
- COVERS 455KC. to 31MC. IN FOUR BANDS
- VARIABLE BFO AND RF GAIN CONTROLS
- BUILT IN PRE-CALIBRATED "S" METER
- SWITCHABLE AVC AND AUTOMATIC NOISE LIMITER

KT-200
IN KIT FORM
64.50 5.00 Down

HE-10 WIRED AND TESTED
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to the station is a small group of houses in which the natives live; most of these are of Caymanian descent and are employed in caretaker and laborer roles.

The smaller island, called "Little Swan", is about a mile and a half long, separated by a narrow channel from the main island and is uninhabited. Both islands have coastlines which are rocky and difficult of access. The larger island, however, has several small sandy beaches where landings can be made. We did not visit Little Swan but were given to understand that it is a fairly rugged and desolate island, with heavily-matted vegetation and dangerous to approach except in very calm seas.

The main island provides a pleasant, tropical environment with a remarkable variety of scenery and color. We were surprised to find that much of the larger island has a carpet of green grass that would do credit to the court house lawn. Rain water is caught on the roofs of the Government buildings from whence it is channeled to cisterns which provide the island's water supply, there being no natural source of drinking water on the island.

In the 1920's cocoanut trees were planted over much of the island's area and in the ensuing years these provided the basis for a thriving export business. A small railroad was constructed to transport the cocoanuts to the dock at one end of the island. In 1955, Swan Island was devastated by a hurricane which virtually shaved the island of its vegetation and structures. Only one reinforced concrete structure (the ham shack!) survived the blow intact, and it was this building which provided shelter for the island's inhabitants during the storm. Although the weather station has been completely reconstructed since 1955, evidence of the storm's ferocity still remains in the many acres of four to five foot cocoanut palm stumps and the twisted wreckage of radio range towers, now overgrown with brush. Many cocoanut palms survived the winds, however, and these, along with new trees which have been planted since the storm, are restoring the island to its former attractiveness.

Evidence of even earlier activities on the island remains in the form of concrete footings for four large radio towers erected by the United Fruit Company here in 1911. The station was discontinued some years later and the towers were taken down in 1932.

In 1948 the U.S. Government erected a number of large steel and concrete buildings on the island for the purpose of establishing a quarantine station for cattle being imported from South America. The project was later abandoned, however, and the incomplete structures now serve as outsized storage barns for the weather station.

The islands enjoy an exceptionally pleasant climate (in between hurricanes which, fortunately, are rare) and the temperature, day and night, remained within the limits of 70 and 86 degrees during our eight day stay. The humidity ranged from 55% to 85% during this period and there was usually a gentle breeze blowing. February, March and April are the months of best weather, although the rainy season from May to October provides much sunshine.

The larger island is free of "varmints" and has no snakes or poisonous insects. Few mosquitoes were noted by us. A few Manchineel trees afford a limited hazard to the unwary.

The most unusual wildlife feature is the island's Iguana population. These big, swift lizards occupy the rocks and cliffs along the shoreline, as well as portions of the interior, where they climb trees to sun themselves on the upper branches. Fortunately, these reptiles are herbivorous and do not possess a temperament matching their fierce mien. They have, in fact, become quite timid by nature and flee as one approaches them, so that they represent difficult photographic subjects. Their ranks have thinned perceptibly over the years as the result of hunting activities, according to the natives.

Substituting for the non-existent swans are large populations of Boobies and Frigate birds (Man-of-War) which nest along the rocky headlands and dot the sky with their streamlined silhouettes. Several pelicans were observed, as well as a number of pigeons. There are a host of small lizards, including the lion lizard with his spiral-wound tail, and chameleons.

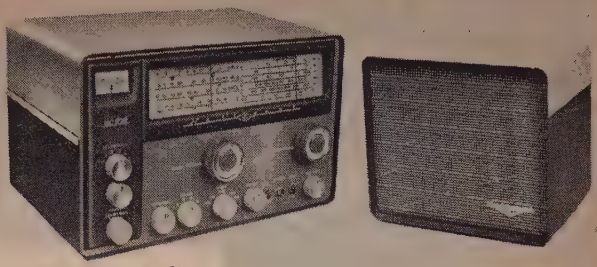
The waters about the island are exceptionally clear and sparkle from deep blue to emerald green as a function of lighting and sky condition. They abound with fish, amberjack, barracuda, queenfish and snappers being taken close

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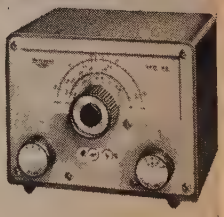
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to shore. Swimming is limited to the one beach near the weather station, and is engaged in with some caution because of the number of shark and barracuda in these waters; no one has been molested to date, however.

Beachcombing, for unusual shells, coral forms, fishing net balls, as well as for the scenery itself, is rewarding and liberally engaged in by the personnel of the Government station, as well as by the natives.

The presence of a radio amateur on the island would provide a substantial morale support to personnel on the island; mail service is slow and irregular, and phone patches or message handling facilities of a ham station would fill an important niche here. In other respects, the place is a ham's paradise; it is strategically located with respect to communication with the U.S. and is far enough away from the states to enjoy separate band openings to other parts of the world. It is a bachelor station, and assignments there are of the order of six months in duration.

Swan Island is less convenient to reach than most Caribbean islands, and DXpeditions there are likely to be infrequent. The possibility of future KS4 activity, therefore, appears to depend largely upon the assignment of an active amateur to one of the F.A.A. or Weather Bureau positions on the island. Should *you* be interested in obtaining further information regarding employment opportunities at this delightful spot, write to one or both of the following:

Weather Bureau Regional Administrator
Fort Worth 2, Texas

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When you arrive, ask Caymanian cooks Al Glidden and John Jefferson to whip you up one of their special banana cream puddings or cocoanut cream pies in their spotless kitchen; the cuisine is absolutely tops! And, oh yes, please keep an ear out for W3KA, W4JNE and W4KFC in next year's DX Contest!

SURPLUS [*from page 72*]

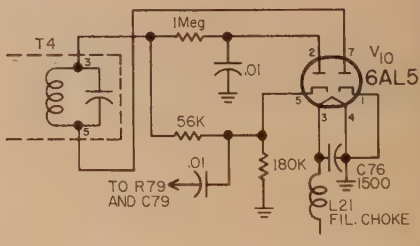


Fig. 2A—Second detector and noise limiter circuit.

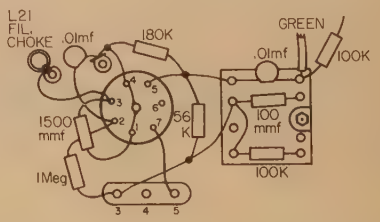


Fig. 2B—Parts layout for detector and limiter.

visible in its entirety. The dial is merely pressed onto the hub, and can easily be removed with a little effort, using only your hand. Reassemble the dial by replacing the disk with the numbers inward and you will have a new dial ready for calibration. Next month, as part of the two meter conversion we will show you how to increase the bandspread.

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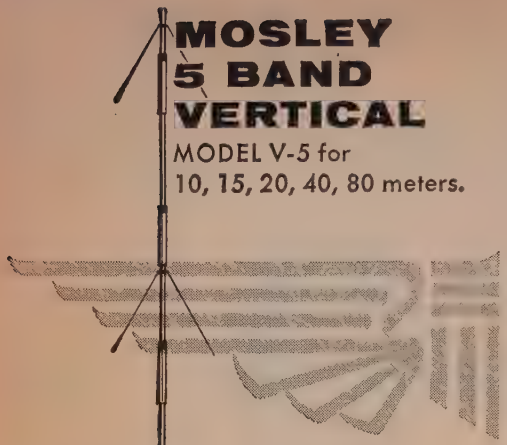
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So far as we know, there are only two sources of the TRC-8 receivers. We got ours from PAM Electronics, 2129-A, E. Holt, Milwaukee 7, Wisconsin. Meshna Electronics, 580 Lynn St., Malden 48, Massachusetts is another source of this and some other interesting surplus equipment. Drop them both a line for their listings, you will be surprised, as I was, by the bargains.

Mail

A very important request has come to us via K6BX, on behalf of "Volt" Sotto, DU7SV, who desperately needs coils for the BC-610E for any band. "Volt" is a well known DU and has provided a lot of hams with QSL's from DU land. He certainly needs and merits our help.

Harold Rorem, 4112 Janet Land, Minneapolis 22, Minnesota needs a manual on the ART-13 and the BC-348-R. In return he offers a TCS-12, SCR-608/628, SCR-508-D/ 538D and 528D and the TDE-2 manuals. H. H. Mills, 3200 Todd Ave., Ft. Worth 10, Texas needs a manual on the BC-AR-230. Frank Krov, Linwood, Nebraska wants help converting a TU-69A to 2 meters.

Dick Hanna, RFD-2, Box 31, Chardon, Ohio needs the handbook on the PE-197. Mr. Francis Cross, 1334 El Caminito West, Tuscon, Arizona, wants any data on the model LLR-6 communications receiver made by Technical Radio Co., of San Francisco. George Leininger Jr., C11 Keyes Addition, Minot, North Dakota, wants a conversion for the BC-604. Major Ernest G. Berger, USAF, PANDPD SHAPE, APO 55, N.Y., N.Y. needs a manual for the AN/USM-24A oscilloscope.

The RT-136/GRC-13 handbook is requested by Frank Vereb, 107 Imhoff St., Lincoln, Nebraska. Clint Sprott, 607 Center Drive, Memphis, Tennessee wants the manual on the RT-7/APN-1. Dave Ward, Box 462, Clarkson College, Potsdam New York needs a BC-1268 Conversion. Jack Ray, 412 W. 4th Street, Tompkinsville, Kentucky wants a six meter conversion of the T-49/AMT-1 radio-sonde. Master Sergeant John D. Williams, 30 Denton Road, Westover AFB, Mass. would like to have a manual on the RBO Navy receiver.

Johnny Cooper, K5DMD, Hattiesburg, Mississippi is compiling I-177 data and will make this publication available in a short time for a very nominal price. Any one interested should contact him. Naturally, this takes time, so contact him first.

The *"Surplus Schematic Handbook"*, after much work, is out. Almost all of U.S. WW2 equipment is included and some late stuff too. There is even a little humor, like our reference to the Mark II equipment in the "conversion" of February 1957 for use as a boat anchor. But, the schematic is there, even though it is all we could ever find on the set. We will continue to run requests on surplus, but as a reference, this should be valuable to any surplus hound.

73, Ken, W2HDM.

SEMICONDUCTORS [*from page 77*]

between 250 and 400 *mc* and will dissipate 60 *mw* at 25°C.

Radio Corporation of America, Somerville, N. J.—RCA's ever expanding line of drift transistors now includes four new drift field germanium PNP alloy types specifically designed for use in FM and AM portables. The 2N1177, 1178, and 1179 are intended for *rf* amplifier, local oscillator, and mixer service, respectively. The 2N1180 is used as a 10.7 *mc if* amplifier.

Sylvania Electric Products, 730 Third Ave., New York 17, N. Y.—The new 1N78D and 78R radar mixer diodes are claimed to be the lowest noise types available. They provide a receiver system with a realistic 7.5 *db* overall noise figure at the Ku band (16,000 *mc*).

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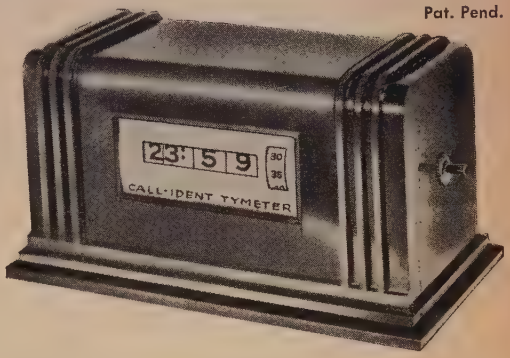
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- Special independent switch to turn timer on when beginning QSO.
- Tymeter electric numeral clock operates continuously.

Walnut or ebony plastic case. 4"H, 7¾"W, 4"D. Wt. 3 lbs. 110V 60 cy. AC. Self starting electric Tymeter clock. 3 year guarantee. UL approved motor and cord.

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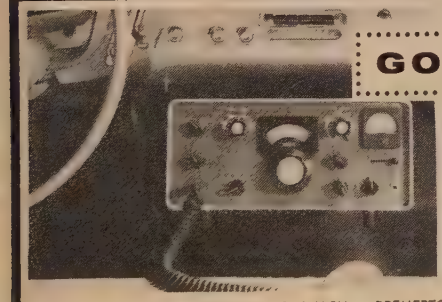


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For further information, check number 37, on page 126

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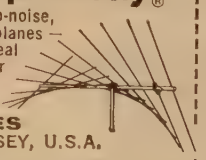
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BC-603 CONVERSION

BC-603 Conversion article (Sept. & Oct., 1958 CQ) Reprints available at 50¢ per set.

CQ Magazine, Book Div.,
300 W. 43 St.
New York 36, N. Y.

Texas Instruments, P. O. Box 312, Dallas, Texas—TI has reduced prices on their MESA transistor line (except 2N122 and 3N35) up to 35% on some types. Also news from TI is their diffused silicon rectifiers, types 1N2069, 2070, and 2071. These units are rated at three-quarters of an ampere and have PIV's of 200, 400, and 600 respectively.



International Rectifier Corp. medium power silicon rectifier stacks rated at 1.5 to 14 amperes with PIV's between 31 and 1500 volts.

So for another month that is the latest semiconductor news. BCNU next issue with lots of news from the IRE show.

73, de Don, W6TNS

NOVICE [*from page 80*]

VS4, PAØ, OKØ. Dick ventures the opinion that a novice DX'er doesn't need high power and a big beam. He loads an 80 meter dipole to 15 meters ,inhales with an S-85 and the exhaler is a DX 40. Nice going Dick!

Jerry Richardson, K5IKL, Box 903 Deming, New Mexico, shrugged off the "N" some time ago, but will still make skeds if anyone needs NM for WAS. Jerry operates on all bands using a Globe Champion and an HQ-110.

John W. Black, K4JNO, Baylor Military Academy, also left the Novice ranks, but still says "Vive La Novice". He agrees wholeheartedly with Carol Hoover, K9AMD, that a Novice can have fun (if you doubt it, read Carol's article in the Jan. issue of CQ). As a Novice John worked 47 countries with 75 watts to an EICO 720 and an SX-71 receiver.

Hack A. Frye, Jr., KN4GCB, 481 Oakland Dr., Elkin, North Carolina, passed the exam but is still waiting for "that piece of paper". Hack thumps away with an S-53A and a Knight transmitter. Antennas include a dipole and a 15 meter beam. I missed his comment about a net, for the net dept., but the boys have organized the Tarheel Novice Net. Anyone who would like to join can write Hack for more info. It meets every day at 4:00 PM EST on 7160.

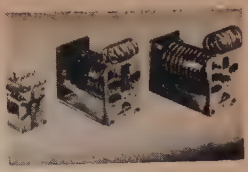
Jim Anderson, KØUCH, 6836 Cleveland Avenue, Lincoln 5, Nebraska, is a new ham, even though he is not a Novice, for he received his general ticket in August. Jim runs a DX-40

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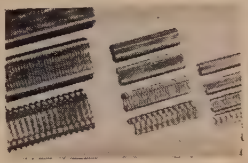
BAND-SWITCHING TURRETS
Bandswitching turrets provide a compact assembly for link coupling between driver and final stages.



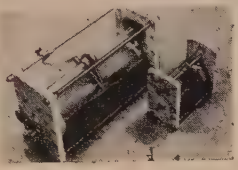
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Bristol, Penna.

For further information, check number 38, on page 126

"All About Cubical Quad Antennas"

William I. Orr, W6SAI, 3A2AF

Here it is! The all-new Handbook with the full, complete story of the famous Cubical Quad antenna! Taking the amateur world by storm, the Quad is "topic number one" whenever DX-minded hams discuss antennas.

All About Cubical Quad Antennas, by William I. Orr, W6SAI (author of the famous *Beam Antenna Handbook* and editor of the *Radio Handbook*) covers the Cubical Quad antenna from *A* to *Z!* Complete in one volume, this informative, non-technical Handbook includes the history, theory, design, construction, and adjustment of single, multiband, and multi-element Quad antennas.

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All About Cubical Quad Antennas, by W6SAI provides the only source of information about the popular Quad antenna. Gain charts! Polar patterns! Angle of radiation charts! Complete tuning information! The *complete* story of the Cubical Quad antenna!

All About Cubical Quad Antennas is available at your local radio dealer during the first weeks of December. For quick delivery by mail from the printer, order your copy direct from: Radio Publications, Inc., Wilton, Conn. Price: $2.85 plus 15¢ to cover cost of packing and shipping. ORDER YOUR COPY NOW! ■

For further information, check number 39, on page 126

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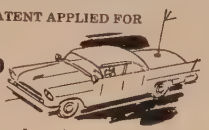
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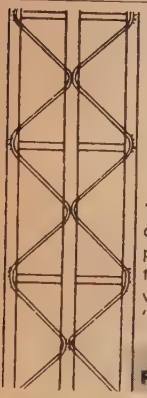
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For further information, check number 46, on page 126



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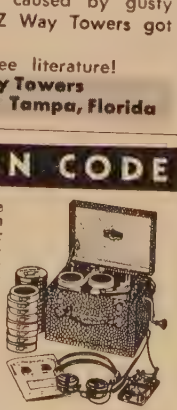
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and S-38E to a vertical. Another change August was the addition of a Heath VF-1 vf His WAS is 41/33 and DX includes VP9, KZ and WP4. Jim will gladly sked anyone needi Nebr.

Jack Lloyd, KNØWNU, Winona, Minn., su has a ham family. The XYL, KNØWNT, ope ates out of the veterinary section of their dru store. She has logged 43 states since Nov. The son, Larry, KNØVMZ, has WAS and countries. Jack's not doing any bragging!

Charles Fontenol, 626 South Parkerso Crowley, Louisiana fills up a slot on 40 and meters with an S-85 and an AT-1 transmitte He has picked off 43 states with 27 confirme in 4 months. The DX includes WP4, WH KG4, VE4 and KZ5. Charles would like sked with the 7th call area and will make skeds wit anyone needing La.

Phil Coley, KN4MPE, 2006 Twain Rd Greensboro, N. C. makes a return to the Novic column. Since his last letter, Phil has worke WAS, WAC, RCC and snagged a CP-15. Ne DX includes VQ2, OQ5, SVØ, ZB1, ZE8, ZS4 HA5, CT1, ZB2 for a country total of 42/1 with his Knight and NC-98 feeding a Gotham element beam. He will sked anyone needin N.C. on 40 or 15 meters.

And with Phil's letter, it screws the lid o tight again for another 30 days or so. Don't fo get to keep us posted on what *you* are doing.

73, de Don, W6TN

CONTEST CALENDAR [*from page 87*]

Sponsored by the Radio Society of Bermud in commemoration of its 10th birthday, this i a most interesting contest. The grand prize is free trip to Bermuda plus a one week's stay fo two at a leading hotel.

The rules are quite simple.

1. Operation limited to four bands, 7, 14, 21 and 28 *mc.*

2. Single operator only, but no limit to equip ment and maximum power is permitted.

3. You can use any mode. Phone to Phone, CW to CW or Phone to CW, but only one con tact per band is permitted with the same station.

4. The signal report is the serial number fo W and VE stations and the signal report plus the parish for VP9 stations.

5. Each contact counts 3 points.

6. The multiplier is determined by the num ber of different Parishes worked on each band.

7. Final score will be the total of parishes worked on each of the four bands multiplied by the total number of points.

8. Besides that fabulou sGrand Prize, the highest scoring station in each call area in the United States and Canada will receive a certificate signed by His Excellency, The Governor of Bermuda.

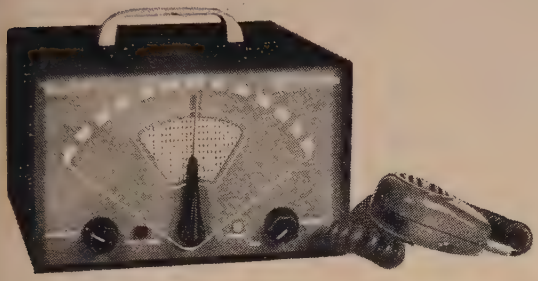
9. Keep times in GMT, check and score your log and sign a declaration that all rules and

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regulations have been observed. Official ld sheets are available by dropping a card to th Radio Society of Bermuda.

Logs must be in the hand of The Conte Committee, P.O. Box 275, Hamilton, Bermuda not later than June 30th, 1960.

That's about it for this time. There will no be much doing until next September, so giv the ex-YL a break and give her a little more c your time.

73 for now, Frank W1W

SB [*from page 89*]

the information. Incidentally, to those of you who missed working Robby in the SSB DX conr test, Robby was not feeling too well and put a little something in his coffee which unfortunately put him to sleep!!!. . . . Mac, K2QXG, advises that Yoh, JA2JW, is on SSB looking for W contacts. . . . Ray, ZL1ATQ, has been chris-tened "Powerhouse of the Pacific" now that he has a new beam up which makes his 50 watts sound more like a KW. . . . New calls to listen for on SSB are ST2AR, Sudan; HP9FC/CEØ, Easter Island; TA4PF, European Turkey; HB-9TL/FL, Liechtenstein; JZØHA, Neth. New Guinea; LZ2KBA, Bulgaria; and K6CQV/KS6, American Samoa.

We've had a number of requests for certificates due from past SSB contests. If your call has appeared on the published lists of SSB DX Contests winners, please drop us a note and we shall be happy to issue your certificate without further delay.

Speaking of certificates, it gave us great pleasure to issue "Worked 100" certificates this month to GM3CIX (the first station in the U.K. to win this award), K6HZP, W3FWD, and W4UWC (only 15 meter SSB operation). In addition, W6YMV received his "Worked 75" certificate. Congratulations to all!

By now, 20 meter operators, and a few visitors from the other bands have had a chance to sample that rare feeling of being "out of the band"—legally, that is—and, for a time, all is well with the world. "Lebensraum"—feels good, doesn't it? We've even managed to work a bit of DX! But wouldn't life be simpler if the W/K ragchewers moved down below 14,300 when yakking it up and give the DXers a break?

Band Hopping

Lew, WA6CAK, writes that there is now a "Vet-Net" on 14,285 *kc* on Wednesdays, 2100 EST—not for participants in past wars but for those dedicated men who keep our pets well!. . . . Evelyn, W8KKO/MM and OM, Earl, W8KKG, enjoyed all the benefits of a DXpedition during their cruise from Los Angeles to New York in February. Jack, W2CD, acted as MC on 7205 *kc*, where Evelyn and Earl made about 300 contacts during the voyage with a record of 53 contacts in 1½ hours one evening. . . . More power to Bill, W5CAC, who is teaching amateur

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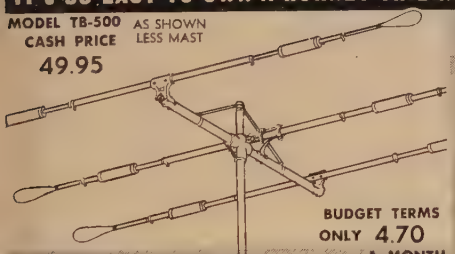




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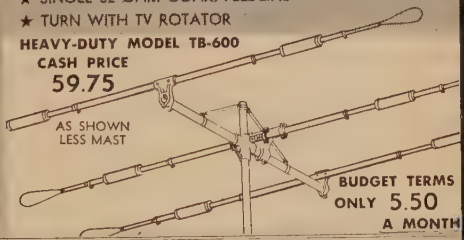


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	20m—7.0 db		20m—1.1				
TB-3	8 db Avg.	25 db	1.2 or less	1000W	1½" O.D. x 18'	16' 2½"	55 lb.
TB-3B	8 db Avg.	25 db	Unity	1000W	1½" O.D. x 18'	16' 2½"	55 lb.

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BUDGET TERMS, ONLY $7.45 A MONTH
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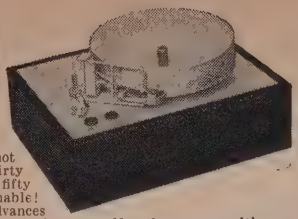
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*Pat. Pending.

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For further information, check number 42, on page 126

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RADIO SHACK CORPORATION

SIDEBAND [*from page 112*]

radio to five youngsters, 10-12 years old, near his Lake Hamilton, Ark. QTH. . . . Don, W4-TFB, was the first we heard of to receive his card from 9N1GW and we hope you others have also received those long-awaited QSLs. Just one word, though, about DXpedition QSLs: much more patience is needed on the part of stations awaiting cards who do not seem to realize the time involved in having special cards printed and logs dispatched before the cards can go forth. . . . Pete, W2MDQ, is another of our avid SSBers who is on a round-the-world cruise. Pete and XYL, Jane, left on March 10 with stops scheduled throughout Asia and Europe before their return home. . . . Mac, K9SOI, operates a phone company in Gleason, Wisc. with 180 subscribers. When Mac isn't helping his XYL at the switchboard, he's putting a Pacemaker through its paces. . . . Clyde, W6HW, is putting out a tremendous signal now that he's added a final. . . . Welcome back to Roy, W4EKA, who's been off the air since 1949 and is now on SSB with an HT-37. . . . Walt, K6GMA, QSL manager for VS4JT and VS6AZ, asks that you take note of his new address, 13841 McMains St., Garden Grove, Calif. Walt is back on the air with the "S" line and homebrew 500 watt linear so we expect a new DX total from Walt in short order.

Thanks for your many complimentary letters. We appreciate your encouragement.

73, Irv and Dorothy

PRODUCT DETECTOR [*from page 51*]

wanted sideband suppression in the order of —40 *db* is readily obtained. The limit is due entirely to the phase shift networks. In filter circuits, it is limited by the quality of the filter.

The 7360 makes an ideal balanced mixer, also. The usual triode or pentagrid mixer has considerable distortion above the 0.2- 0.3 volt range. In addition, the local oscillator injection frequency is present at the output. The 7360 is not subject to either of these two limitations. The deflectors are capable of handling up to 8 volts peak-to-peak without serious distortion. Since the 7360 is a balanced tube, the carrier or local oscillator is cancelled in the plate circuit independently of the deflector signal. Even without balance controls at least 25 *db* of local oscillator rejection can be expected. In filter exciters, this suppression in addition to the 20 *db* filter carrier attenuation, is more than adequate. With an ascillator injection of 10 volts *p-p* and a deflector drive of 8 volts *p-p*, a double sideband output signal of 40 volts *p-p* is realized. Of course, this is excessive for filter circuits, but ideal in phasing exciters. In a filter application, the 7360 would operate at a lower level and produce even less distortion. When used as a mixer, with 40 volts peak-to-peak, the major third order distortion component is about 42 *db* below the sideband output and the major fourth order distortion component is down at least 35 *db*. If this tube were used in place of the 6BA7

in the Central Electronics series exciters, it would not be necessary to trap out the third harmonic of the 5 *mc* heterodyne oscillator.

The author would like to venture out on a very long, but sturdy limb and predict that this tube and associated circuits will soon be widely used in amateur and commercial SSB generating and receiving equipment.

In addition, the author wishes to express his thanks to Radio Corporation of America, Copyright Proprietor, for supplying reference material for this article. ■

SB SUPPRESSION [*from page 45*]

receiver to the furthest point out on the *unwanted* side at which signal modulation may be found. The difference between the original signal frequency and that at which the receiver is now tuned will be the bandwidth on the *unwanted* sideband (minus any error which may be due to receiver selectivity deficiencies as discussed herein). At the same time observations may be made of the relative suppression out to any point on the *unwanted* side.

The bandwidth on the *wanted* side may be similarly checked with the sideband selector set for the *wanted* sideband reception, this time tuning on the *wanted* side to the furthest point at which the signals may be found.

Thus a report may be given of the total bandwidth (lower plus upper), or it may be given for each sideband separately, and in the case of the *unwanted* side a report can include the frequency deviations at which a certain degree of suppression is found (within the limitations of the receiver capabilities as determined earlier from the test procedures).

Any unwanted sideband signal which can be heard or indicated as being less than 20 or 25 *db* down, at more than several hundred cycles away from the carrier frequency, generally may be indicative of inferior overall suppression which may be the result of exciter misalignment, too high a modulating level, amplifier overloading and "flat-topping", amplifier non-linearity, incorrect neutralization, parasitics, etc.

When any observations are being made, care must be taken so as not to mistake adjacent channel signals from other stations for those of the transmitter being checked. ■

2 METERS [*from page 39*]

Guard Channel Receiver

The guard channel receiver is a very convenient adjunct for amateur operation. This channel may be set up for the local club or emergency frequency and left on while the main-channel set is used anywhere in the band. Any transmission on the guard channel will break through and alert the operator to ac-

[*Continued on page 117*]

Extends to 50 feet

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hy-gain hy-Tower

24' 2"

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For further information, check number 46, on page 126

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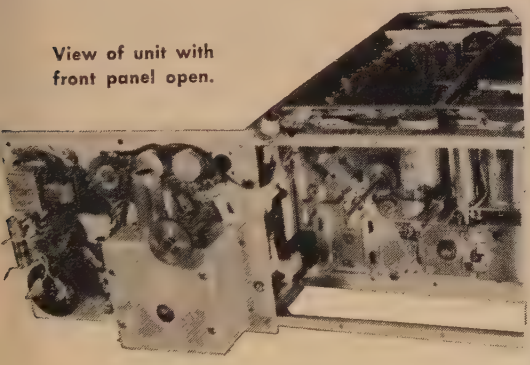
USE HANDY ORDER FORM AT LEFT.

SEE PREVIOUS ADS FOR DESCRIPTION OF ALL BOOKS.

2 METER [*from page 115*]

ivity on the net frequency. Select the crystal or this channel by the same formula as for he main-channel set. Install the crystal, turn on the guard channel receiver and advance the audio and *rf* gain controls. The following alignmen procedure should be used:

SIGNAL	METER	TEST POINT	ADJUSTMENT
None	0-1 MA DC	D & E	Peak L-166 and back off to 80% of maximum
None	DC VTVM	C & D, D grounded	Peak L-167, L-168 and L-169
Air signal or sig. gen.	Audio output meter	Phone jack	Peak L-161, L-162, L-163 and L-164
None	DC VTVM	C & D	Peak L-169
Air signal or sig. gen.	Audio output meter	Phone jack	Peak L-163 and L-164



View of unit with front panel open.

Unlike most surplus equipment, an abundance of audio gain is provided in this transmitter. While no reference can be found in the manuals on this set, strapping the speech input circuit as shown in fig. 8 permits the use of a low impedance dynamic microphone. The lack of a transmit audio gain control did not prove any handicap, as the gain is just about optimum for the various microphones tested with this transmitter.

Conversion of the AN/ARC-1, along the lines indicated, is certainly not a one evening project and should not be attempted by anyone without considerable experience. However, the results more than justify the effort and the cost, for a complete station, is nominal. The considerations of performance and operating convenience that make the commercial counterpart of this unit so justifiably popular apply, in most part, to this conversion. ■



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Here is a sturdy, low cost, quality tower that is ideal for novice or technician. The same E-Z WAY standard of quality found in our higher priced towers has been incorporated into the LEADER-40. Cranks up to 40' - down to 20'. Equipped with winch and safety rest. Will support 2M, 6M, or Quad unguyed. Mast extra.

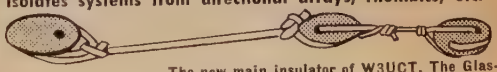
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Top Flight Distributors
▶ Write for catalog CL 40

E-Z WAY TOWERS, INC.
P. O. BOX 5491 - TAMPA, FLA.

For further information, check number 47, on page 126

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View of an open thimble and eye bolt for coupling the Glas-Line guy wire to a tree. GLAS-LINE cannot rot, will not shrink, stretch or sag . . . has high breaking strength of over 500 pounds with proper use.

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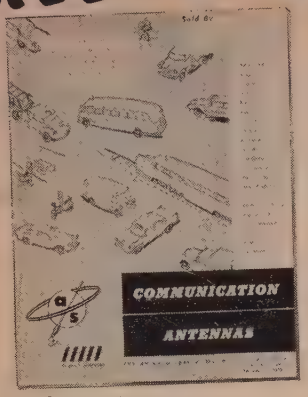
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CONTEST [*from page 49*]

PAØWWP						
	21	30,616	143	33	56	B
PI1RRS						
	21	8,640	84	17	28	B
PAØMRN						
	21	180	6	4	6	B
PAØATY						
	14	4,578	90	10	32	—
PAØWIL						
	14	3,604	79	8	26	B
FAØNIR						
	14	90	10	3	7	—

Northern Ireland

GI3JIM	A	82,650	223	54	96	B

Norway

LA6CF	A	74,718	297	43	83	B
LA1JG	A	62,895	225	39	66	B
LA4LE	A	17,015	137	26	57	B
LA1OE	28	2,368	33	13	19	A
LA5HE	21	45,629	172	31	72	B
LA3IF	21	429	31	3	10	B

Poland

SP5XM	A	23,406	183	28	66	B
SP3PH	A	2,583	48	14	27	C
SP5ZZ	28	92,391	347	30	73	C
SP7HX	28	6,300	54	16	29	B
SP9RF	21	7,701	85	17	34	B
SP3GZ	14	12,711	189	16	41	B
SP2KAC						
	14	7,396	155	11	32	—
SP8AG	14	2,673	94	6	21	B
SP5AH	14	1,512	32	10	14	B
SP5GN	14	1,092	20	12	16	B
SP3HC	14	1,078	50	4	18	A
SP8KDF						
	14	648	38	4	14	A

Portugal

CT1AP	28	33,157	184	20	51	B
CT1FM	28	13,454	92	20	42	B
CT1JG	21	16,790	131	22	51	B

Rhodes

SVØWV						
	14	7,738	86	16	37	C

Roumania

YO3VI	A	153,722	458	58	144	B

Scotland

GM3BCL						
	A	119,016	311	49	103	B

Spain

EA5FI	A	38,064	152	41	81	C
EA3LA	A	16,625	113	29	66	—
EA5DY	A	14,910	134	21	49	B
EA4GT	A	14,652	143	24	50	B
EA2DT	A	11,392	76	23	41	A
EA5FH	A	7,097	91	17	30	B
EA4EP	28	9,845	81	16	39	B
EA2CK	21	11,842	83	19	43	B
EA3KO	21	8,456	77	10	37	A
EA3MO	21	500	20	6	14	—
EA7CP	14	18,810	135	19	47	B

Switzerland

HB9KO	A	23,805	86	39	76	B

Sweden

SM3BIZ	A	91,317	303	59	124	B
SM3EP	A	70,220	237	46	108	B
SM5AQV						
	A	58,320	216	46	89	C
SM2AKA						
	A	34,968	201	36	88	B
SM5BFR						
	A	18,020	123	28	40	C
SM5AJR						
	A	9,177	112	18	51	B
SM7AFK						
	A	5,168	49	22	46	B
SM7TQ	A	3,283	45	18	31	C
SM7CNA						
	A	437	13	8	11	B
SL6CV	A	442	24	5	12	—
SM3AZI						
	28	21,016	112	23	48	B
SM2BFE						
	28	1,035	21	10	13	A
SM5AJU						
	21	1,421	30	9	20	B
SM5MC						
	21	378	14	6	12	C
SM6SA	14	54,873	266	28	63	C
SM5AIO						
	14	2,905	58	10	25	—
SM3AVQ						
	14	2,673	94	6	21	B

Wales

GW3FPH						
	28	56,960	230	28	61	B
GW3CDP						
	21	38,514	181	29	69	—
GW3LLU						
	14	42,240	264	22	38	B

Yugoslavia

YU3OV	A	76,912	295	46	106	A
YU1SF	A	2,050	73	5	20	B

U. S. S. R.

European

UA4HP	A	10,356	117	19	49	

Ukraine

UB5CI	A	118,695	372	62	143	I
UB5LV	28	12,100	137	15	40	
UB5KCV						
	14	1,032	42	5	19	

Latvia

UQ2AN	A	33,480	182	39	85	—

Estonia

UR2BU	A	217,674	440	77	184	F

OCEANIA

Australia

VK3AHO						
	A	129,507	306	61	86	E
VK4FH	A	47,400	139	33	54	—
VK4HD						
	28	26,600	138	25	45	E
VK5JO	21	648	12	8	10	—
VK6SM	A	62,776	117	48	85	E
VK7WA	A	15,488	86	28	36	E

Christmas Is.

VR3X	14	6	1	1	1	A

Fiji Is.

VR2BC	A	34,800	138	42	58	B

Hawaii

KH6BXU						
	A	30,485	147	41	50	—
KH6DGL						
	A	2,068	34	12	10	D
KH6CLC						
	28	57,933	478	18	23	C
KH6DLD						
	21	92,870	453	28	46	B

Marianas Is.

K6MOG/KG6						
	28	6,942	70	15	24	B

Marshall Is.

KX6CR	21	22,950	159	20	34	C

New Zealand

ZL1MQ	A	159,253	370	68	85	B
ZL1AIX	A	147,957	304	61	88	B
ZL1PV	A	25,502	109	29	53	B
ZL1ACI						
	21	74,579	245	30	77	B
ZL3OB	21	45,036	193	23	58	B
ZL4LB	14	9,840	85	17	24	B

Philippines

DU7SV	A	52,560	274	22	50	—

Wake Island

K6QPG/KW6						
	A	14,762	115	29	32	B

SOUTH AMERICA

Argentina

LU8CW	A	206,934	407	63	119	B
LU4DMG						
	A	17,952	94	29	38	C
LU9FAH						
	28	78,660	287	31	64	B
LU2FCD						
	28	2,457	49	9	12	—

Brazil

PY2AUC						
	A	34,914	175	25	43	B
PY3AFO						
	28	7,224	58	20	23	A
PY1AKT						
	21	67,617	245	30	69	B
PY3AHJ						
	21	48,984	217	25	53	C
PY4OD	21	13,167	80	22	41	B

Chile

CE3GI	28	36,366	192	25	41	B
CE3DY	21	200,508	531	35	97	D

Colombia

HK7LX	A	88,440	231	44	88	C
HK3OK	A	22,950	112	29	46	B

Ecuador

HC1IE	21	103,600	395	26	66	C

Netherlands, W. I.

PJ2AF	A	140,448	326	52	100	B

Peru

OA4AO	A	36,624	131	45	64	B
OA4HK	21	23,430	131	24	42	B
OA4AV	21	7,686	66	17	25	—

Uruguay

CX2CO	A	491,052	639	87	184	D
CX1AK	28	124,937	425	31	70	B
CX5BR	28	93,744	368	28	60	—
CX2CN	28	51,333	248	26	45	B
CX9CO	14	25,830	136	24	46	C

Multi-Operator

Single Transmitter

NORTH AMERICA

United States

.2SUX A 39,676 142 36 73 D
(K2SUX—W2HZY)

/4QKK A 97,524 217 66 123 D
(W4QKK—W4HXC)

/4NPT A 46,950 142 59 91 C
(W4ICS—K6JIC)

6EVR A 160,994 315 79 123 D
(K6EVR—W6UED)

/6AM 28 5,814 58 17 21 D
(W6AM—W3TMZ—W6OZ—K6UYC)

6ICQ 28 4,104 55 16 20 B
(K6ICQ—K6ICS)

/91RH A 39,260 126 63 88 B
(W9IRH—W9FVT—K9HMY)

Canada

/E1RK A 19,734 119 25 44 B
(VE1MX—VE1ZQ)

AFRICA

Morocco

CN8AR A 417,358 679 62 149 B
(CN8AR—CN8EH—CN8EV—CN8JR)

South Africa

ZS50A A 63,373 188 45 82 B
(ZS50A—ZS50B)

ASIA

Saudi Arabia

HZ1AB A 476,190 815 57 141 D
(W4ERQ—K5IUO)
(K5MMI—K6LYM)
(W6NZL—K9PBV—KØILI)

Taiwan

BV1USC A 232,470 531 67 95 D
("Phil" & "Gay")

EUROPE

Bulgaria

LZ1KSV
14 10,810 191 12 34—
(Club Station)

Czechoslovakia

OK1KKR
A 127,444 362 57 154 B
(Club Station)

OK3IT 14 18,349 249 13 46 B
(Club Station)

England

GB2SM A 282,266 527 65 149 B
(Radio Club)

G3HTA A 166,336 325 65 119 B
(G3HTA—G3JW)

G3NTJ A 137,280 123 16 39 B
(Radio Club)

Finland

OH3AD A 4,331 58 18 43 B
(Radio Club)

Germany

DJ3VM A 325,105 496 84 173 C
(DJ3VM—DL3AO)
(DL1CR—DJ1BT—DJ3JZ)

DL6NK A 286,405 472 68 177 B
(DL6NK—DL1HC)
(DJ3YV—DL9GU)

DL4PQ 21 24,840 192 17 29 C
(DL4PQ—DL4ACN)

Hungary

HA1KSA
A 25,700 174 29 71 B
(Club Station)

HA7KLL
A 14,850 206 17 49 B
(Club Station)

Italy

I1BAF A 44,500 165 42 83 A
(CI1BAF—I1ZEG)

Portugal

CT1EY A 164,604 437 50 124 B
(CT1EY—CT1YE)

Sweden

SL5AB A 34,220 180 39 79—
(SM2BJQ—SM2CIJ)

SM5AQB
21 24,960 153 27 53 B
(SM5AQB—SM5AQN—SM5WI)

SM5AZU
21 7,168 66 16 40 B
(SM5AZU—SM5ATN—SM5BGM)

U. S. S. R.

Estonia

UR2KAE
14 8,200 192 9 32 C
(Club Station)

Ukraine

UB5KCE
21 19,886 113 9 34 A
(Club Station)

SOUTH AMERICA

Paraguay

ZP5CG 21 18,072 93 26 46—
(ZP5CG—ZP5JP)

OCEANIA

Hawaii

KH6BYZ
A 138,224 463 49 57 D
(KH6BYZ—KH6CJJ—KH6EM)

Mariana Is.

KG6AIA
28 12,840 112 16 24 C
(KG6AIA—W5OXJ)

Multi-Operator

Multi-Transmitter

NORTH AMERICA

W8NGO A 82,641 190 58 105 C
(W8NGO—W8CLR)
(W8ONA—K8LSG)

AFRICA

ET2US A 160,758 471 41 76 D
(K1IXZ—K1LQN)
(WA2HYC—W3FYL)
(W4EJX—W4FGZ—K8NUM)

ASIA

KA2RB A 205,042 468 72 79 B
(W2YRP—K3JKL)
(W7OCD—W7YBI)

EUROPE

DL4OL/P
A 25,602 155 32 70 B
(Radio Club)

EA3KT A 97,370 311 51 131 B
(EA3KT—EA3MS)

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W2KYA	GI4RY	OZ3EA
W3BVO	HA5BI	PAØEEM
W5EDX	HB9J	PAØHBO
K5OGP	HB9UL	PAØHIL
W7BTH	JA1ANA	PAØSNG
W7ZVY	LU9DAH	PAØTV
W8FTQ	OH2IK	PAØWWP
W8QQH	OQ5CK	SM5AZU
F9WK	OR4RW	SM5MN
ISWL/DL8497	YO8-415	ZL1AMM

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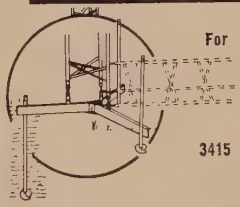
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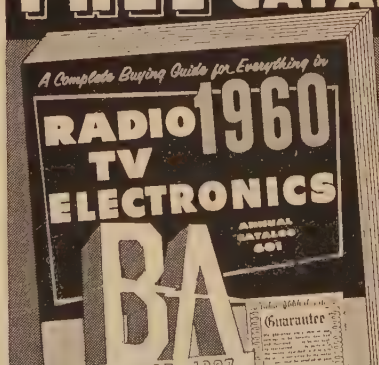
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2mf 600ldew, 40¢, 4/$1.50 1mf 1000 vdew, 55c. 2/$1.00
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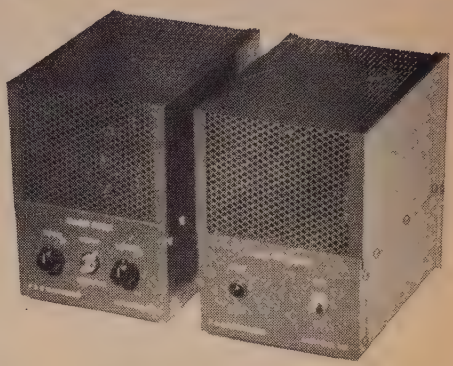
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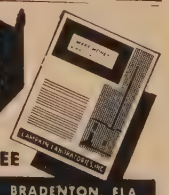
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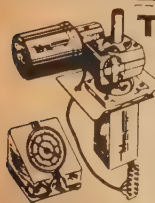
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SSB ARGONAUT [*from page 41*]

might go blithely on from one exotic spot to another forever. Needless to say, however, it is much easier to write about these many successful operations than it was to make them all happen. After the Maldive operation disaster struck but fast! Suddenly the Argonaut disappeared. It had left the Maldives, no question about that. But it had not arrived at Aden, its next scheduled stop. Take our word for it, finding an unmarked 11½ pound plywood box with a metal handle on it is not the easiest job.

As month followed unsuccessful month we began to realize that this was more than 11 pounds of aluminum and steel and glass for which we were searching. This little Argonaut had become, in our minds, a really vital symbol of adventure and excitement and accomplishment. As Robbie, VQ4ERR, pointed out to us one morning on 20 meters, this was the story of Pinocchio all over again and if we ever regained our Argonaut we must forthwith rechristen it Pinocchio. And find our Argonaut again we did, thanks to Robin, VS9AH, who questioned and searched and inspected and opened until finally that nondescript little plywood box which had been shoved back in the corner yielded its secret. So Aden was on SSB and after some six weeks the voyage was under way again. At this writing the hero of our story is proudly on the air from I5GN at Mogodiscio, Italian Somaliland in the possession of Pat and Jere Nudsan. Nor is this we hope the last of its storied exploits. Already arrangements have begun for operation from VQ6LQ, in British Somaliland, then down to Dave Taylor, ZD6DT, in Nyasaland. Tentative plans are brewing for an extended stay in Tannarive, Madagascar and there is more than a slight possibility that our little Argonaut may visit Guy, FR7ZD, on Reunion Island. And so it will go for many months to come.

Every operator who has used the rig has marvelled that this little insignificant bit of nothing can talk so far with such a big voice. As Pat, I5GN, said to us recently on the air, she feels that some day it should end up in the Smithsonian Institute. While we are just prejudiced enough in this matter to agree with her, what we really hope is that after a long and adventurous career, some day the Argonaut will come back to an honored spot in our radio den as a permanent reminder of our most meaningful adventure in amateur radio. ■

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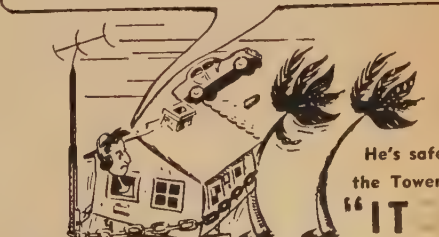
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New Variacs/or equiv 0-132V/1.25A $7.25
RF-MTR GE/475 Ma & 5 Amp $4@, 2/$7
DC-METER Dejur 800 Ma/3½" $3@, 2/$5
DC-METER One Ma/4" Rd. $5@, 2/$8
RF-MTR Weston 750Ma/TC... $4@, 2/$6
DC MTR 100Ma/2½"..... $3@, 2/$5

BC696/3 to 4 mc's good condition ... $5.95
AN-ARR2/RCVR less tubes A-1 cndtn $1.95
RDZ/USN 200-400 Mcs Rcvrs As Is .. $25
G.E./YRS-1 Side Band Selector..... $45
829B Socket 85¢, 2/$1.50, 813 Socket $1
4x150 Ceramic/LOKTAL..... 2 for $1.00
W.E. 416B Higain—HiMu $4

Silicon 866A Tube Replacement Rectifier Rated 3000 Ma at 4500V-RMS or 6400PIV. Operates —65 to + 165°C. Max 12.5 VDC Drop 300Ma "VACDAC" ST866.
Each $16.



5u4 or Equiv. 1600PIV/1100 Rms at 750Ma. ST5u4 ..... $9

RECTIFIERS 130V/RMS HALF-WAVE

75Ma 49c, 5 for $2; 100Ma 59c, 6 for $3
150Ma 70c, 8 for $5; 250Ma 79c, 6 for $4
300Ma 88c, 5 for $4; 350Ma $1.00, 8 for $7
400Ma $1.10, 5 for $5; 500Ma $1.35, 5 for $5
This Item P.Pd. 48 states orders $10.

*"TAB" for NEW TRANSISTORS!

2N38	$.98	2N442	$5.00	2N441	$3.00
2N155	3.25	2N256	1.45	2N234A	1.36
2N156	4.45	2N277	4.50	2N422	5.00
2N174	12.00	2N278	5.50	CK722	.95

Postpaid 48 States Orders $10

"TAB" Tubes Tested, Inspected, Boxed

Six Months Guaranteed! No Rejects!
GOVT & MFGRS Surplus! New & Used

0A2	.70	6BZ7	1.25	*We Buy & Sell*	
0A3	.80	6C4	.45	43	.75
0B2	.65	6C5	.69	45	.49
0C3	.70	6C6	1.08	50L6	.69
0D3	.50	6C8	1.08	RK59	1.39
0Z4	.60	*We Trade!*		RK60	1.17
1A7	.90	6CB6	.89	HY69	2.20
1B3	.78	6CD6	1.49	75	.81
1L4	.82	6CF6	.85	HY75	5.00
1R4	5/$1	6CL6	1.40	83	.95

We Swap Tubes! What Do/U Have?

1R5	.78	6CB6	.89	4PR60A	37.50
1S4	.78	6CG8	1.12	4-125A	27.50
1S5	.68	6CM6	.79	4X150G	15.00
1T4	.85	6CS6	.70	4X250B	41.00
1T5	.95	6CU6	1.29	4-400A	41.75
1U4	6/$1	6D6	.99	4E27A	39.00
1U5	.75	6E5	.79	250TL	19.45
1X2	.99	6F4	2.49	307A	2/$1
2C39A	9.00	6F5	.63	316A	5/$1
2C40	5.50	6F6	.99	VR92	5/$1

Send 25¢ for Catalog!

2C43	6.50	6F7	.99	388A	3/$1
2C51	2.00	6F8	1.39	350A	2.45
2D21	.65	6H6	.59	350B	1.75
2E22	1.75	6J4	1.72	371B	.95
2E24	1.90	6J5	.59	6146	3.90
2E25	2.50	6J6	.59	416B	16.00
2E26	2.75	6J7	.99	450TH	43.00
2E30	1.75	6J8	1.39	450TL	43.00
2E35	1.60	6K6	.59	460	11.50
2K25	9.75	6K7	.79		

All Tubes Stocked at Low Prices!

2K26	34.00	6K8	.99	703A	2.00
2K28	30.00	6L6	1.19	707B	3.50
2V3	2/$1	6SN7	.72	715C	10.90
2X2	.48	6T8	.99	717A	5/$1
3A4	.70	6V6GT	.90	723AB	5.00
3A5	1.00	6X5	.49	725A	2.75
3API	5.95	12AT6	.59	803	3.50
3BPI	3.99	12AT7	.89	804	8.85
3C24	3.50	12AU6	.63	805	6.00
3D23	3.95	12AU7	.69		

We Buy!

3E29	6.00	*We Sell!*		*We Trade!*	
3Q4	.68	12AX7	.79	807	1.10
3Q5	.86	12AY7	1.29	5/$5, 10/$12	
4-65A	13.50	12B4	.95		
4-125A	27.50	12BA6	.65	811	3.45
4-250A	34.00	12BA7	.99	811A	4.41
4X150A	7.00	12BD6	.59	812	3.30
4X250	36.00	12BE6	.59	813	8.00
4X500	37.00	12BH6	.79	815	3.15
5API	2.95	12BH7	.99	826	.59

Wanted Test Sets and Equipment

5BP1	5.02	12BZ7	.99	828	9.00
5BP4	5.00	12H6	.75	829B	8.00
5CP1	4.99	12J5	.69	832A	6.00
5CP7	9.00	12J7	.69	833A	36.00
5R4	1.00	12J8	1.35	837	2/$2
5T4	.90	12K8	.89	866A	2.45
5U4	.99	12SA7	.69	954	10/$1
5V4	.89	12SC7	.89	955	3/$1
5Y3	.60	12SF5	.69	957	3/$1
5Z3	.89	12SG7	.89	958A	2/$1

Send 25¢ for Catalog!

15GP22	89.00	12SH7	.89	991	5/$1
6A7	1.00	12SJ7	.75	1614	2.75
6A8	.99	12SK7	.75	1619	5/$1
6AB4	.59	12SL7	.79	1620	2.00
6AC7	.72	12SN7	.69	1625	5/$1
6AG5	.65	12SQ7	.69	1626	5/$1
6AG7	.75	12SR7	.69	1629	4/$1
6AK5	.69	15E	1.19	2050	1.25
6AL5	.59	15R	4/$1	5517	1.25
6AQ5	.66	FG17	3.49	5608	3.95

Top $$$ Paid for 304TL tubes

6AR6	1.95	19T8	1.16	5618	3.25
6AS7	3.49	24G	3.50	5651	1.35
6AT6	2/$1	25A6	1.19	5654	1.20
6AU6	.79	25A7	2.19	5656	4.25
6B8	1.35	25C5	.81	5663	1.15
6BA6	.59	25L6	.72	5670	.90
6BE6	.59	25T	4.00	5686	1.75
6BG6	1.49	25Z5	.72	5687	1.15
6BH6	.79	25Z6	.75	5691	4.70
6BJ6	.72	26A7	3.69	5725	1.95

Top $$$ Paid for XMTR Tubes!

6BK7	.99	FG27	8.28	5732	2.00
6BL7	1.35	HV27	19.39	5736	85.00
6BN4	.69	28D7	.89	5749	1.95
6BN6	1.08	FG33	15.00	5750	2.75
6BN7	1.99	EL34	3.49	5751	1.25
6BQ6	1.19	35A5	.69	5814	1.20
6BQ7	.99	35L6	.59	5879	1.90
6BX7	1.11	35T	4.49	5894	12.00
6BY5	1.19	35Z5	.89		
6BZ6	.91	RK39	2.99	No See—Write!	

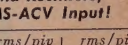
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Leece Neville Charger Systems "SILTAB" Silicon Rectifier Replacement Non-Aging Hermetically Sealed

FOR 6 or 12VDC @ 100A, Type YJ9 $24



*New Silicon 500Ma Rectifiers, Working Range RMS-ACV Input!

rms/piv	rms/piv	rms/piv	rms/piv
35/50 30¢	70/100 45¢	140/200 50¢	210/300 65¢
rms/piv	rms/piv	rms/piv	rms/piv
280/400 78¢	350/500 $1.00	420/600 $1.26	490/700 $1.50
rms/piv	rms/piv	rms/piv	rms/piv
560/800 $1.59	630/900 $1.89	700/1000 $2.58	770/1100 $3.12

Use in Bridge or C.T. up to 750ma dc

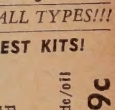
GENERAL PURPOSE & REPLACEMENT

*Silicon 400PIV. at 250 Ma Rectifiers Hi-Temp 106°C at 252V/RMS. Special 2 for $1; 25 for $10.

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NEW BATTERY CHARGER !!! FOR 2V OR 4V OR 6V OR 12 VOLT BATTERIES, TRICKLE & FULL CHARGE up to 4 AMP

Charges 2-4-6 & 12 volt batteries.



Built BCK-1 ..... $13.50

*"TAB" GUARANTEED XTALS!

HAM BAND 80 or 40Mtrs ..... $1@
NOVICE BAND ..... $1@
CITIZENS BAND ..... $3@
Include 1st, 2nd, 3rd & 4th choice!
On XTALS!
Postpaid 48 States XTALS Only

Send 25¢ for Catalog

Wanted 304TL Tubes & ALL TYPES!!!

"TAB" FOR THE BEST KITS!

99c

ONE EACH ABOVE KIT ONLY.....

Kit Adj Wire Striper & Cut
Kit 2 Bakelite Panels 6x12"
Kit 5 pcs Wrench Set
Kit 8 pcs Nut Driver Set
Kit Hi Gain Xtal Mike
Kit 6 ea Phonoplugs & Jacks
Kit 25 ft Lo-Cap Mike Cable
Kit 18' Lo-Cap 2 Cond M-Cable
Kit 20 ft RG59U Coax Cable
Kit 15 ft RG11U Coax Cable
Kit 2 pair SO239 & PL59
Kit 12 Binding Posts Asstd
Kit 5 Phone Jacks Asstd
Kit 3 Phone Plugs Asstd
Kit Long Nose Plier
Kit Side Cutter Plier
Kit 2 X'mttr Variables
Kit 5 of 2mfd @ 600wvdc/oil

Each "TAB" Kit Contains The Finest Selection!!!

KITS!

Kit 6 AN Plugs & cnnctrs
Kit 5 Sub-Min Tubes
Kit 40 Standoff Insulators
Kit 35 Power Resistors
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Kit 200ft Hook Up Wire
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Kit 100 Fuses, assorted types
Kit 100 Ceramic Condensers
Kit 5 FT243 Xtal Holders
Kit 5 Microswitches
Kit 10 Wheat Lamps
Kit 3 Transistor Xfmrs
Kit 8 Xtal Ose-Blanks
Kit 4 Asstd Rectifiers
Kit 12 Alligator Clips Asstd
Kit 5 UG/Connectors
Kit 100 Self/Tap Screws

Kit 5 Mycalex Glass/HF Strips
Kit 35 Precision Resistors
Kit 10 Switches
Kit 75 Resistors ½/1/2W
Kit 150 Carbon Resistors
Kit 25 Panel Lamps
Kit 12 Electrolytic Cond's
Kit 5 Volume Controls
Kit 56 Tube Sockets
Kit 15 Tubular Condensers
Kit 500 Lugs & Eyelets
Kit 10 Bathtub Oil Cond's
Kit 5 lbs. Surprise Package
Kit 10 Transmit Mica Cond's
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KWM-2 Transceiver . $1095.00
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Transmitter Receiver,
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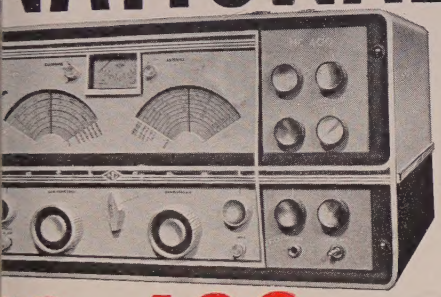


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NC-400

The Most Versatile Communications Receiver Ever Designed

coverage receiver. Tuning range is 540 kc to 31 mc in 7 bands, with dual conversion on all frequencies above 7 mc. Its unique design provides maximum flexibility of operation to satisfy a wide variety of communications requirements.

The NC-400 may be used as a self-contained unit, either manually tuned or crystal controlled on pre-selected frequencies. In addition, external master oscillator provisions make possible use of modern synthesizer techniques for applications where extreme frequency stability is required. It may be operated in space or frequency diversity applications. Provisions are made for interconnection of any required outputs or for feed to external loads or combiners. All frequency determining circuits may be internally or externally controlled. The NC-400 also provides optimum versatility of bandwidth, either through the use of internal IF circuits or the use of optional mechanical filters.

FREQUENCY RANGE:	GENERAL COVERAGE
Band 1	.54– 1.1 MC
Band 2	1.1 – 2.1 MC
Band 3	2.1 – 4.1 MC
Band 4	4.1 – 7.0 MC
Band 5	6.9 –12.2 MC
Band 6	11.8 –20.4 MC
Band 7	19.6 –31.0 MC

NOTE: Bandspread dial provided with 0-100 logging scale and calibrated for 80, 40, 20, 15 and 10 meter amateur bands.

FREQUENCY STABILITY: Long term stability after warm-up –.002%

SENSITIVITY: 1 microvolt for 10 db signal/noise ratio

SELECTIVITY: 4, 8 and 16 kc positions provided with 6 tuned circuits. 3.5 kc wide upper and lower sideband positions provided with 14 tuned circuits. 3.5 kc sharp position activates plug-in crystal filter providing 5 additional degrees of selectivity below 3 kc plus phasing notch. Plug-in accessory available which will provide front panel selection of three mechanical filters without modification of receiver. Proper choice of filters will enable selection of bandwidths from 500 cycles to 16 kc, or will enable filter type of sideband selection from front panel.

SSB PROVISIONS: Separate SSB heterodyne detector uses pentagrid converter and separate beat oscillator. Beat oscillator may be crystal controlled. Special "fast-attack-slow release" AGC circuit. Sideband selection accomplished by exclusive, new National passband switching techniques. In the event of commercial-type SSB reception, single sideband mechanical filters may be installed and switched from front panel.

FIXED CHANNEL OPERATION: HF oscillator has 5 crystal sockets for use in fixed channel operation. Channels may be selected by front panel switch. In addition, HF oscillator may be controlled from external master oscillator selected by front panel switch. "S" meter "Tune" position permits rapid tuning of receiver to crystal controlled channel.

DIVERSITY PROVISIONS: Basic receiver may be operated from master oscillator as noted above. An accessory Diversity Modification Kit (NC-400 DMK) allows choice of internal or external control of all oscillators. Rear panel selector provisions make possible use of any receiver either as master control, or slave fed from other oscillator sources. IF, detector and AGC outputs available for feed to external loads or combiners.

POWER REQUIREMENTS: 110-220 volts, 50-60 cycles AC

MANUFACTURER'S SUGGESTED LIST PRICE: $895.

OPTIONAL ACCESSORIES:

1. XCU-400 crystal calibrator. Output frequencies of 100 kc. and 1 mc.
2. NTS-2 matching speaker
3. NC-400 DMK diversity modification kit
4. NC-400 FH mechanical filter housing

*Manufacturer's suggested list price. Sold only by National Co. Franchised Distributors

In Canada by Canadian Marconi Inc., 830 Bayview Ave., Toronto, Ontario

National

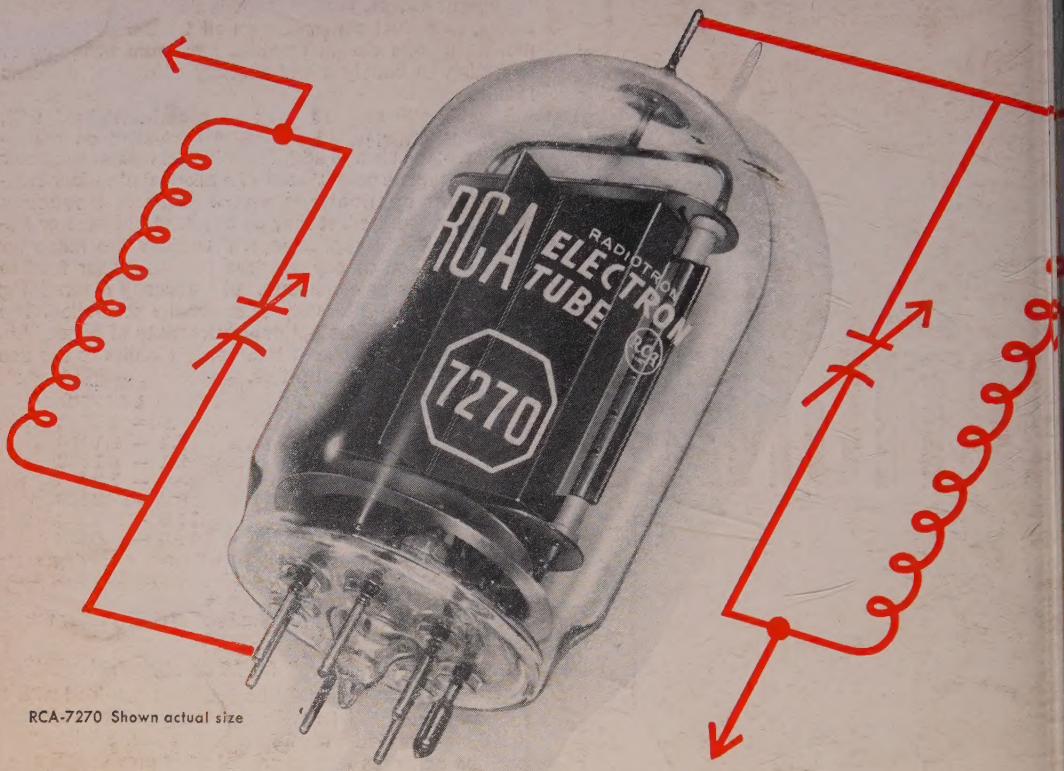
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RCA-7270 Shown actual size

The FIRST High-Perveance "300-WATT" Input Beam Power Tube...ever designed for Amateurs

• 315 watts CW input up to 60 Mc • 235 watts CW input up to 175 M

Fix your eyes on this—one of the sweetest little beam power tubes ever designed and built for an amateur medium-power transmitter.

Here, in a compact unit no bigger than a child's fist, is an all-new tube that takes over *a quarter KW input to 2 meters.* High-perveance design—an original RCA development—enables you to get maximum power with a plate voltage of only 1350 volts. High power gain makes it easy to drive one RCA-7270 (or two in push-pull or parallel) with a single RCA-2E26 or -5763 through 10 meters—or a single 2E26 for 6- and 2-meter operation.

Check the chart for a quick appraisal of the RCA-7270's capabilities. For a complete technical bulletin on SSB, AM and CW use, qsl, RCA Commercial Engineering, Sec. E-15-M, Harrison, N. J.

Typical Operation in Amateur Service

Type of Service	CW	AM
Heater Volts	6.3	6.3
DC Plate Volts	1250	1000
DC Grid No. 2 Volts	300	400
DC Grid No. 1 Volts	—80	—107
DC Plate Ma	250	190
Required Driver Power Output Watts (approx.)	4	4
Useful Output Watts (approx.)●	225	130

*Max. Signal Value ▲With Single-Tone Mo
●Measured at load of output circuit havi efficiency

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Another Example of RCA's Contribution to Amateu